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JAPANESE BATTLESHIPS KASUGA AND NISSHIM.



BATTLESHIP NISSHIM.

the armament, having two 8-in. guns placed in the forward barbette in lieu of one 10-in. gun. The keels of these ships

Especial interest attaches to a description of the battleships Rivadavia and Moreno built by the Ansaldo firm in Genoa for the Argentine republic and lately sold by Argentina to the imperial Japanese government, the two ships being rechristened Kasuga and Nisshim respectively. These ships may be considered as twin: the second differing from the first only in

were laid down in March and April, 1902, respectively. Their dimensions and principal data are as follows:

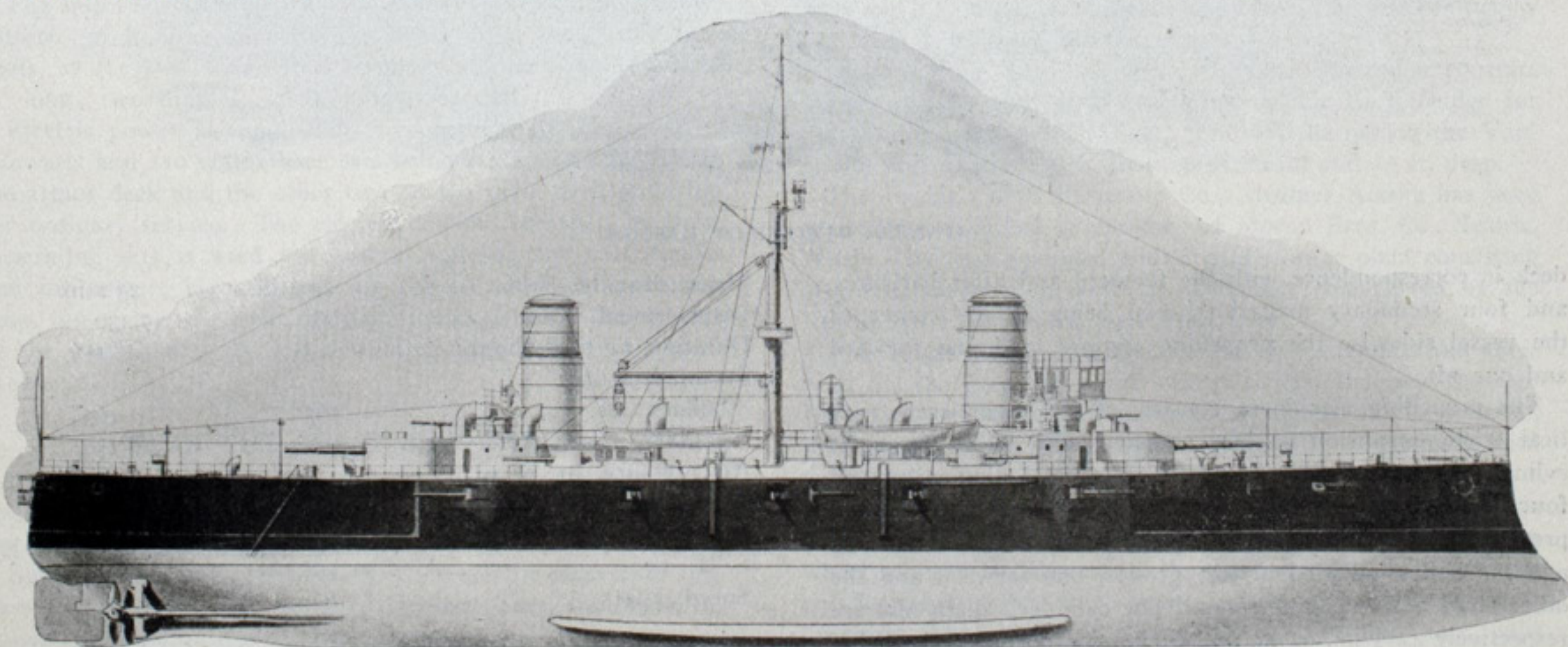
Length over all, 357 ft.; length between perpendiculars, 344 ft.; extreme beam, 61 ft. 4 in.; depth, 24 ft.; mean draught, 24 ft.; displacement, 7,750 tons.

The protection of the ship is given by nickel steel armor plates made at the Terni works. There is a complete belt at the waterline of 6-in. armor tapering to 2¾ in. at the two ends of the ship. This belt extends in height from 5 ft. below to 4 ft. above water.

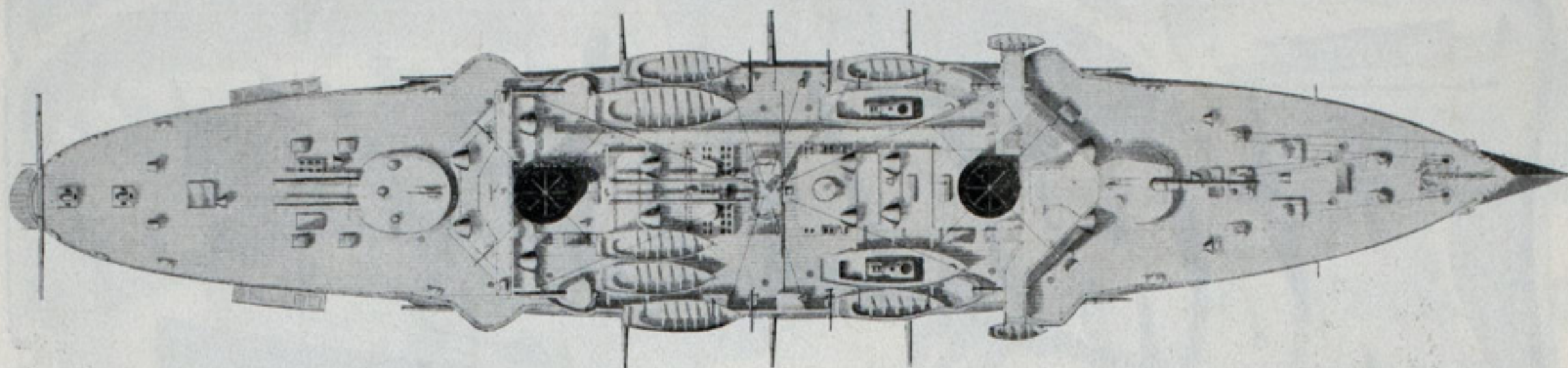
Inside the belt, the interior of the ship is further protected by an armor deck 1½ in. thick extending over the whole length of the ship, such deck having trapezoidal form with central part horizontal well high above water, and sides sloping down to lower edge of belt. Between the armor deck and the upper deck there is a central armored redoubt extending for about half the length of the ship, the shipside plates being 6 in. thick, and the athwartship bulkhead plates 5¾ in. thick. The upper deck over the redoubt is made of two steel plates having a total thickness of 13-5 in. Beyond the central redoubt the berth deck is ¾ in. thick.

The armament comprises:

One quick-firing 10-in. gun in a forward barbette on the ship Kasuga, and two quick-firing 8-in. guns in the same barbette on the other ship Nisshim; ten quick-firing 6-in.



LONGITUDINAL VIEW OF JAPANESE BATTLESHIPS KASUGA AND NISSHIM.



DECK VIEW OF JAPANESE BATTLESHIPS KASUGA AND NISSHIM.

guns on the main deck; four quick-firing 6-in. guns on the upper deck; four quick-firing 3-in. guns at the ends of the main deck; six quick-firing 3-in. guns on the upper deck; six 3-lb. guns; two automatic Maxim guns; two 3-in. landing guns. There are moreover four above-water torpedo tubes in armored casemates on the lower deck at the corner of the central redoubt, inside the same.

There are two main magazines situated under the protective

the heating surface 34,380 sq. ft. The forced draft is obtained by twelve fans situated in the boiler rooms. The coal capacity is about 1,200 tons, of which 600 tons in the service coal bunkers under the armored deck, and 600 tons in the reserve bunkers on the same deck. The radius of action at 10 knots speeds is about 9,000 miles.

The results of the official trials under natural and forced draft were as follows:



JAPANESE BATTLESHIP KASUGA.

deck in correspondence with the forward and after barbettes, and four secondary magazines, two being in the center of the vessel sidewise the propelling engines, and one forward and one aft.

The propelling machinery consists of two twin-screw, vertical triple expansion engines supplied with steam by eight cylindrical marine boilers of which four are double-ended and four single-ended. The whole machinery is fitted beneath the protective deck, the engine being in the center of the vessel and the boilers divided in two groups, one forward and the other abaft of the engine room. The cylinder's diameters are respectively 42½ in., 63 in., and 93 in., the piston stroke being 46 in. The total grate surface of the boilers is 893 sq. ft. and

Mean draught, feet.....	23 2 in.	23 2 in.
Displacement, tons	7,450	7,450
Duration of trial, hour....	6	1½
Steam pressure:		
boilers, lbs.	165	165
engines, lbs.	158	154
Air pressure, in. of w....		¼ in.
Vacuum, inches	27½	27
Revolutions per minute..	95	108
I. H. 1.	11,318	15,049
Speed, knots	18.6	20.2

The vessels are fitted with a steam capstan for heaving the anchors, steering gear worked by two steam engines, one



JAPANESE BATTLESHIP NISSHIM.

for service and the other a spare one. There are two powerful steam winches for the service of the boats and of the Temperley coaling apparatus; two air compressors with electric motors for torpedo tubes; one Thyron pump of the capacity of 400 tons per hour, drawing both from bilge and sea, with jet for fire service; three distilling apparatuses capable of producing collectively 18,000 litres of water per day; one ice-making machine capable of producing 500 kilg. of ice per day; one Valiant self-removing fire engine; one kneading machine with electric motor; one washing-machine for linen; a complete set of machine tools driven by electric motors, viz: lathe, drills, emery grindstones, filing and counter-sinking machines, etc.; for the workshop.

The ship's boats are as follows: Two steam launches, White pattern, 36 ft. long; one pulling boat, 36 ft. long; two life-boats, 27 ft., 9 in. long; four common pulling boats, 29 ft., 6 in. long; two dingies, 17 ft. long; one raft.

Electric power is supplied by five generating sets, each 33 kilowatts and 110 volts, three sets being placed forward under the armor deck and the other two on the main deck amidship for ordinary service. The electric current furnished by these generating sets is used for general lighting for searchlights and for power; viz.: for moving the 10 and 8-in. casemates guns, for firing the guns, for ammunition hoists, for motors of the workshop tools, for ventilating fans and for air compressor.

WITH THE COAST SHIP YARDS.

The Western Engineering & Construction Co. of San Francisco are preparing to construct two large improved gold mining dredges at Marysville, Cal.

Spratt & Betchtell, Victoria, B. C., were the successful bidders for repairing the damaged steamer Tess, the work involving an expenditure of about \$15,000.

The bid of the Heffernan Engine Works, Seattle, Wash.,

for the construction of a small steamer for government use at Port Townsend, Wash., amounting to \$21,800 has been accepted.

At the yard of Wm. A. Boole & Son, Oakland, Cal., the new gasoline schooner Expansion is having new machinery installed. She is expected to be ready for her trial within the next few days.

The Bay City Iron Works, Bellingham, Cal., have been purchased by G. E. Adams, J. F. Howe and Charles Burnett, Jr. The works will be enlarged and it is reported that a ship building plant will be added.

The tug Sadie Ross, built by Richard Keough, East Boston, Mass., was launched last week. She is 72 ft. long, 17½ ft. wide and 8 ft. deep. Compound engines will be fitted in her by Bertelsen & Petersen, Boston, Mass.

Dickie's Ship Yard, Alameda, Cal. has secured a contract for the construction of a steel schooner for E. I. Dodge for the Pacific coast lumber trade. She will be named the Vanguard, and will be 140 ft. long, 32 ft. beam and 10 ft. deep.

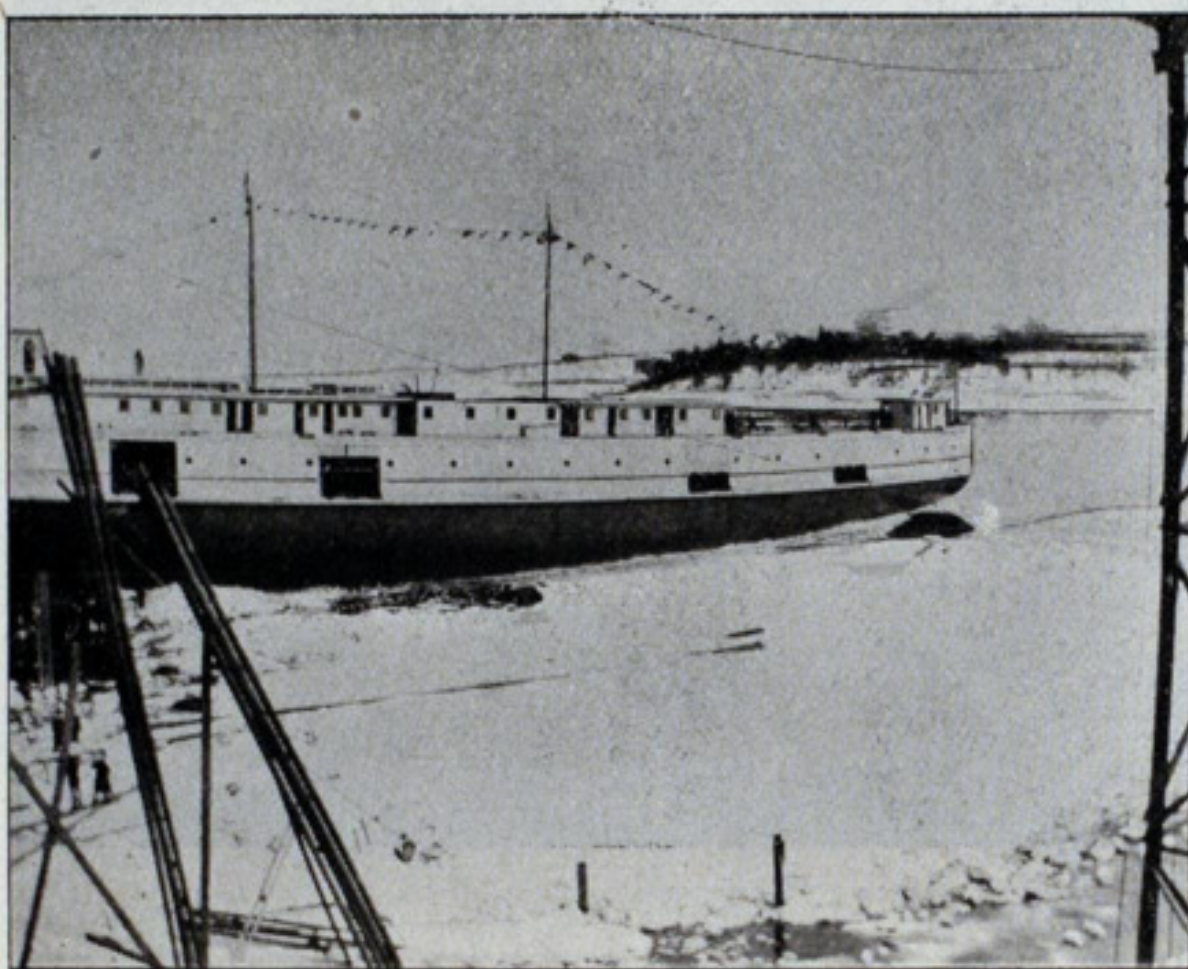
The Pacific Coast Steamship Co.'s steamer Alaska has been generally overhauled at the yard of Moran Bros. Co., Seattle, Wash. She was equipped with a cold storage plant consisting of three refrigerators and ice machinery constructed by the Vulcan Iron Works of San Francisco.

The Puget Sound Navigation Co. will launch from their yard on the Puyallup river near Tacoma, the new steamer Jefferson next month. This vessel measures 216 ft. over all, 38 ft. beam, 16 ft. 6 in. depth. She will be equipped with triple-expansion engines with three Scotch boilers.

Joseph Supple, Portland, Ore., has received an order from the Northern Commercial Co. of San Francisco for a stern wheel steamer for service on the Tanana river. The steamer will be 140 ft. long, 30 ft. beam, but of an exceedingly light draught. The Williamette Iron Works, Portland, Ore., will build the machinery.

TWIN-SCREW FREIGHT STEAMER BOSTON.

The Review briefly mentioned last week the launch at the yard of the Fore River Ship & Engine Co., Quincy, Mass., of the steel twin-screw freight steamer Boston, built for the Long Island Sound service of the Old Colony Steamboat Co. Further particulars are now at hand. Her general dimensions are as follows: Length moulded on 10 ft. water line, 291 ft. 3 in.; length over all, 318 ft.; width moulded, widest part, 60 ft. 6 in.; width over guards, widest part, 63 ft.; depth moulded at lowest place in shear, 22 ft. 6 in. The vessel is fitted with double bottom 3 ft. deep in center, extending the length of the machinery space. The propelling machinery consists of two triple-expansion engines, having cylinders 24, 37 and 63 by 42 in. stroke, designed for a working pressure of 180 lbs. per square inch, which will drive the vessel at a speed of 19 knots



LAUNCH OF FREIGHT STEAMER BOSTON.
[Building by Fore River Ship and Engine Co., Quincy, Mass.]

per hour with an indicated horse power of approximately 5,500. Steam is generated in eight Scotch boilers 14 ft. 2½ in. in diameter by 12 ft. from head to head. There is also a donkey boiler 7 ft. in diameter for supplying steam to the auxiliaries. Forced draft is supplied by two Sturtevant steel plate blowers.

The main air pump is driven from the low-pressure cross-head. The other pumps are independent and are as follows: Two 12 by 7 by 12 in. special duplex outside back plunger feed pumps; one 18½ by 12 by 12 in. fire and wrecking pump; one 6 by 4 by 7 duplex piston pump for sanitary and water service; one 5 by 5¾ by 7 single pump donkey boiler feed; one No. 6 Cameron crank and fly wheel pump for bilge; two 30-in. circulating pumps.

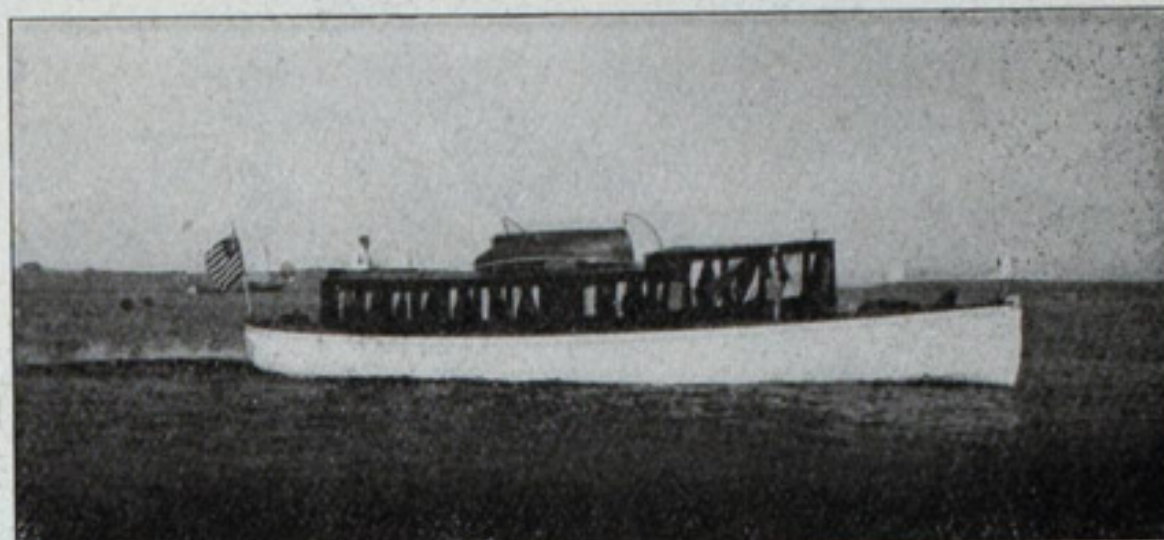
The circulating pumps are of the centrifugal type, having a 12-in. suction and 10-in. discharge, the runner being 30 in. diameter. Each pump is driven by a single vertical engine having a cylinder 7 in. by 7 in. stroke.

The Boston has certain improvements in design over other vessels engaged in similar service and is built under rigid inspection. She is equipped with electric lighting, steam heating and ventilating systems. In addition to carrying freight, she is provided with accommodations for 40 passengers, these accommodations being first class in all respects.

President Roosevelt, acting under the authority of the Spooner law, has announced that the salaries of each of the members of the Panama canal commission will be \$12,000 per year, with an allowance of \$15 per day for each member while on the Isthmus. No allowance is made for expenses while the commissioners are in the United States, but the various expenses of the commission as an official body will, of course, be provided for by further canal legislation.

GASOLINE LAUNCHES.

The full cabin launch, illustrated herewith, was designed for S. B. Kitchel of Coldwater, Mich., by Frederick S. Nock and built at his yard at East Greenwich, R. I. The length on



CABIN LAUNCH; SPEED 17¼ MILES.

deck is 60 ft., on the water line 57 ft., beam extreme 8 ft., draught of hull 2 ft., draught under propellers 2 ft 9 in. Her accommodation, considering the fact that she was built for a fast boat, are excellent, consisting of a pilot house 7 ft. long, main cabin 7 ft. 6 in. long, with galley and toilet room between. The construction of the boat is about medium, the planking of yellow pine being 1 in. at the garboards and ¾ in. at the sheer strake. The upper strakes are in one length from stem to stern, as also are the keelson, keel, bilge clamps, deck clamps, etc. The fastenings are yellow metal screws. The finish of the boat both inside and out is of mahogany. The power plant consists of two Buffalo motors capable of developing about 40 H. P. each. The propellers are small, being but 30 in. in diameter and the pitch 36 in. During her maiden trip to Albany she made a run of 126 miles in 8 hours and 3 minutes, part of which time she was running under one engine alone on account of one of the bearings in the starboard engine being heated. The latter part of the trip was made at about 17½ miles an hour.

Accompanying is also a photo of the launch Circe, which



LAUNCH CIRCE; SPEED 18 MILES.

has a record of 12 miles an hour. She is not, however, a racing machine but a good able craft. The general dimensions are as follows: Length over all, 28 ft.; length water line, 26 ft.; beam, 6 ft.; draught, 1 ft. The motors were manufactured by the Buffalo Gas Motor Co. Several of the Circe type of boats have been placed in various parts of the country and have given much satisfaction.

With the appointment of H. H. Gildersleeve as manager of the Northern Navigation Co. there is a general change in the staff. W. Askin, heretofore assistant manager at Sarnia; A. B. Pratt, heretofore assistant manager at Collingwood, and A. Cowan, freight agent at Toronto, have resigned, and will be connected with the new company now being formed of the Canada Lakes & Ocean Navigation Co. and the New Ontario Steamship Co. F. P. Belcher, traveling freight agent at Winnipeg, has resigned.

CUNARD LINE MAY QUIT LIVERPOOL.

Shipping Interests on the Mersey are Much Excited Over a Bill to Alter the System of Rating Vessels—Orders for New Tonnage Given.

Liverpool, March 14.—The great question which is exercising the minds of shipping men here and indeed the shipping authorities of every British port, is the Mersey Docks and Harbor Board's bill now under discussion by a select committee of the house of lords, which seeks to alter the present system of rating vessels from net register tonnage, to a basis of 50 per cent. of the gross register. And what has come like a thunderclap and caused no little consternation in Liverpool is the statement by Lord Inverclyde, the chairman of the Cunard Steamship Co., in opposing the bill, that there is a possibility that if this change should receive the sanction of parliament, the fast Cunarders engaged mainly in the passenger and mail business may quit Liverpool for some other cheaper and less harrassing port. The bill is in every respect similar to the one promoted by the dock board last year, and on that occasion, as on the present, the Cunard company offered strenuous opposition. The result then was that, although the house of lords passed the bill so far as it related to the change sought for, from net register to 50 per cent. of the gross tonnage of vessels, yet the house of commons only gave the board 40 per cent. instead of 50 per cent., whereupon the bill was withdrawn, and now comes to parliament again with a view of obtaining the full 50 per cent. Space will not permit of any detailed treatment of the evidence adduced, but the object the dock board has in view may be shortly stated, namely, to get at those vessels which on account of their low net register have escaped paying their proper proportion of port charges for the accommodation afforded them. These vessels may, generally speaking, be said to be the fast passenger liners, and passenger coasting steamers whose low net register is mainly due to such a large amount of space being taken up by engines, boilers and bunkers. The coasters have made out a good case for themselves by showing that on account of the frequency of their visits to the port, they pay more per ton than vessels of higher net register, while the accommodation they enjoy has not necessitated any great capital outlay in recent years. It is the Cunard company that stands to be most severely hit by the proposed change, involving as it would in the case of the *Campania* an extra charge of £100, and so on with the *Lucania*, *Etruria* and *Umbria*, amounting in all to about £2,500 per annum. But what is the most ungrateful feature about this question is the fact that although the fast passenger Cunarders have been paying the full port dues all along, it is only quite recently that facilities for docking have been provided for them. But I had better give you Lord Inverclyde's evidence in extenso on this point. "The ships of the Cunard company," he contended, "must be taken as a whole with regard to dues. He admitted that the dock board had had to provide deeper sills in order to get their ships in Liverpool, but he did not think that at any time the dock board had been ahead of the requirements of ship owners in the port. Until 1902 they had had to transfer cargo to barges from their larger vessels lying in the river and land it at the quays and they had to pay tonnage dues to the dock board whether their ships were in dock or not. It was only now they had got the accommodation they had been paying dock dues for during so many years. There was no serious difficulty in moving a line of large ships to another port. They had had to give great consideration to the point where was the best port to take their passenger traffic to and from. They had very great competition indeed from other ports and he ventured to think that it was only by great efforts on the part of the passenger lines at Liverpool that the passenger traffic had been retained there, and whether it was possible to continue to do so, depended upon many circumstances, and such a question as paying increased dues upon fast ships would have a very great bearing indeed. He stated that in every case the dues were very considerably higher at

Liverpool than any foreign ship had to pay for similar or better advantages."

FAST MAIL STEAMERS NOT THE MOST PROFITABLE.

Mr. Moorhouse, the general manager of the Cunard company has asserted that it is a mistake to think that the fast mail boats were the most profitable of ships,—it was the intermediate boats that paid the best, consequently all the big ships lately built were of this intermediate type. But it is not the present fleet of the Cunard company which is alone concerned. There are the two new "flyers," which will more than likely have a very low net register, owing to the space being nearly all taken up by engines and boilers, and as one authority states, the dock board proposed is in effect a tax on speed. It is also said to be a grave matter for consideration how far the change proposed, if extended beyond Liverpool, would check the development of the shipping industry of the country, and this phase of the question was touched upon by Sir William White, late director of naval construction and assistant controller of her majesty's navy who also opposed the bill. The select committee have already found that the preamble of the bill has been proved, and its further progress through parliament will arouse wide interest as well as considerable anxiety locally, for fear that the dock board may succeed in driving away from Liverpool the Cunard Line as they did the Inman Line. The fact that the directors of the Cunard Line have been considering the question of leaving the Mersey ought to indicate to the dock board the necessity of trying to come to some amicable arrangement, ere it is too late.

Apropos of the Atlantic fast mail services, it is worth noting what developments are taking place at Plymouth where traffic is being sought after and not driven away as in Liverpool. In view of the fact that Plymouth has now become the first port of call on the homeward journey for all the Atlantic mail steamers of the American Line, the London & South Western Railway Co., have erected a new ocean quay station at Stonehouse Pool, which is connected with their main line at Devonport, and which will provide the necessary accommodation for the reception of either passengers or mails. Constructed immediately opposite the Royal William victualing yard and the Royal naval ordnance depot, the quay enjoys all the advantages of a well protected harbor. The managers of the American Line have been so well pleased with all that has been done for the accommodation of their vessels by the London & South Western Railway Co. that they have entered into a further arrangement which will come into operation on Saturday, April 9. On and after that date the steamship *Victoria* which has hitherto been engaged, with much success, in the South Western Co.'s service between Jersey and St. Malo, will act as tender. The *Victoria* is of a much superior type to any vessel hitherto employed at Plymouth for such work, for in addition to ample deck space for the reception of incoming mails, she has a large saloon, in which passengers will find welcome shelter during the inclement weather. On landing at the ocean quay, they will submit their baggage for the inspection of the custom officers, and then enter the express train ready to convey them direct to London. The journey to London will be without a stop, the train covering the distance of 230 miles in four and a half hours. For this service the London & South Western Co. have just built a very handsome and richly appointed corridor train, containing restaurant cars and the first sleeping cars ever used on their system and this will be brought into use on April 9, next, in carrying the passengers who disembark at Plymouth from the steamer *St. Louis*.

A forward move is also being made in connection with the Canadian Pacific steamship service between Bristol and Dominion ports. Increased cold storage accommodation is to be provided and that points to the early prospect of material increase in the shipments of produce. There is an improving market for all kinds of dairy products as well as fruit, for which Bristol is a large distributing center. The dock officials

at Avonmouth are sparing no effort to facilitate the unloading of Canadian steamers there with the least delay, and the results have so far fully justified the up-to-date methods that have been adopted,—and are being introduced—at the docks.

SEVERAL ORDERS FOR NEW TONNAGE GIVEN.

There is excellent authority for stating that since the beginning of the present year, Liverpool ship owners have given out a large number of orders for new steamship tonnage. Ten local firms are mentioned who have ordered at least one steamer each, several of them two each, and one four vessels, all intended for the general carrying trade. The average carrying capacity of these vessels is 6,000 tons, and accepting ten as the minimum number ordered, there is 60,000 tons which at an average of £6 per ton represents a capital expenditure of £300,000, but the actual value of the new orders is at least half a million pounds sterling. The orders have gone to the east coast and the Clyde where they will be very welcome after the period of depression through which ship building in those districts has passed. In this connection this improvement in ship building is beginning to tell on the steel trade. In the north of England, the plate mills are not only busy on the numerous orders lately booked, but still find a brisk inquiry. There is a strong suspicion that prices will soon be again advanced and ship builders, anticipating this, are coming into the market to cover their requirements in good time. Hence the market is firm and the bookings are such that another 2s 6d or 5s a ton rise is quite possible before the present month is out. Meanwhile steel ship plates are officially quoted at £5 12s 6d and iron ditto at £6 5s.

It is most unfortunate that the Canadian authorities when they put the new lightship on the dreaded Lurcher shoal in the Bay of Fundy, did not make some arrangements for the supply of a spare lightship in the case of emergency. Incoming captains inform me that this lightship, which would have been of the great possible assistance to ship masters, after being on the station two days, parted her cables, and had to make St. John's where at the time of writing she is said to be lying. Surely the port of St. John is able to supply her with a new cable and send her out again and at once. Unfortunately, however, this does not seem to have been done, and it will not be surprising to hear of some serious disaster on this shoal owing to this tardy action of the Canadian authorities.

It is rumored here that with a view of establishing a new line of steamers between South Africa and Swedish ports a Gothenburg company has ordered to be built in England two new vessels of 5,500 tons each, of special capacity for the carriage of lumber. It is also intended to purchase two other steamers in order to maintain a regular weekly service between Sweden and South Africa.

CONTROL OF SHIPPING COMBINATION NOT PASSED.

Statements current here and emanating from New York are to the effect that the British shareholders have secured control of the International Mercantile Marine Co., but one can hardly see how this is possible under the stipulations made at the time of the formation of the shipping combination. The control of the company does not lie with the shareholders, ordinary or preferred, but with the firm voting trustees appointed by the promoters at the inception of the company. These are Messrs. J. Pierpont Morgan, W. J. Pirrie, J. Bruce Ismay, Peter A. B. Widener, & Charles Steele, and three of them are bound to be Americans. The shareholders, in fact, are not likely to have any voice whatever in the management until Oct. 1, 1907, as by the endorsement on the certificates, it is stipulated that no stock certificates shall be delivered prior to that date. Undoubtedly the reports have arisen in consequence of the appointment of Mr. J. Bruce Ismay as the president of the combination. Mr. Pierpont Morgan remains a voting trustee as heretofore. As Mr. Ismay has been chosen president and managing director by reason of his successful

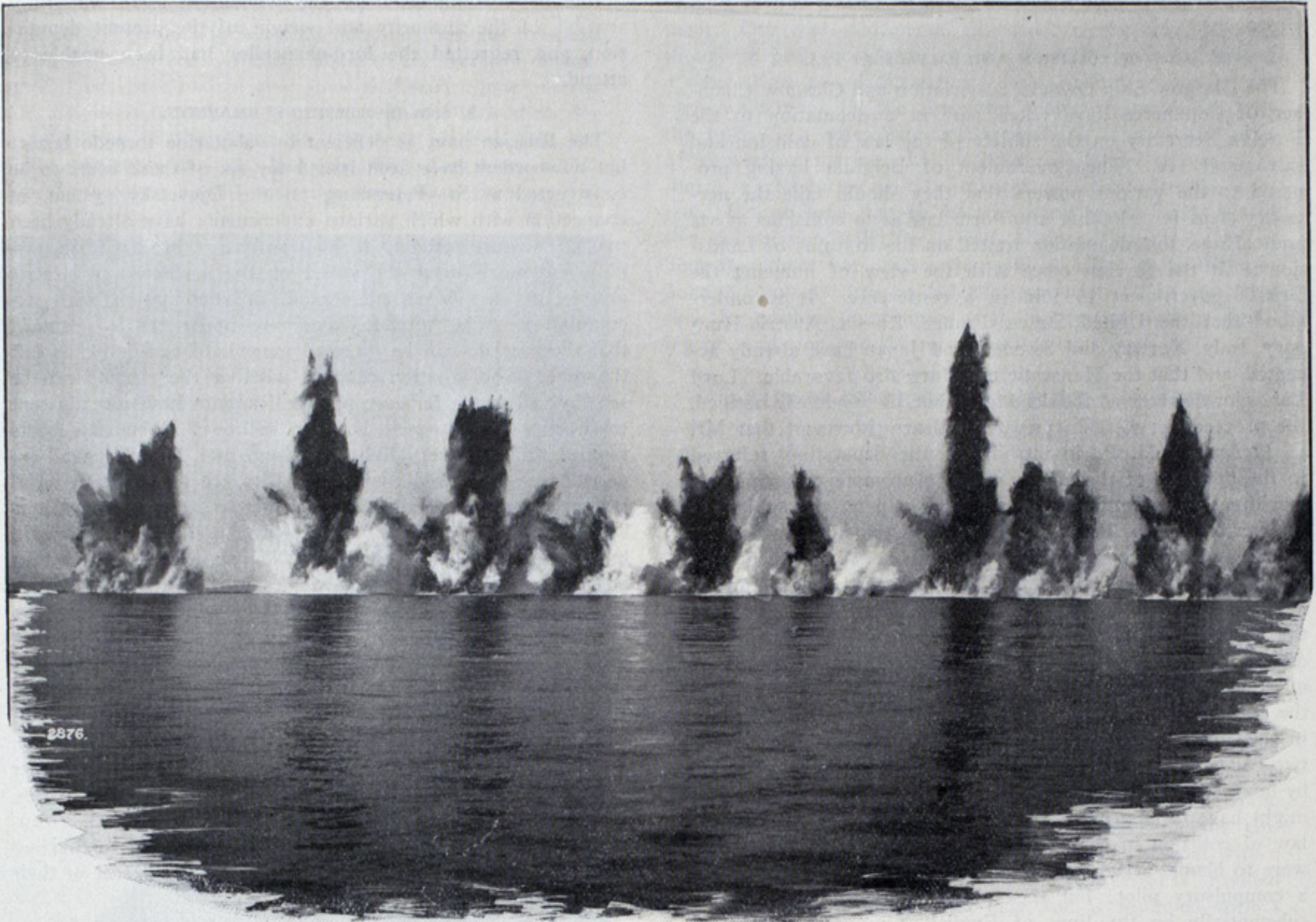
management of the White Star Line, the statement that English methods and English ideas will characterize his business action may almost be regarded as an announcement of the obvious. The opinion held here is that no man could have taken in hand the duties of president with a better chance of making the combine lines successful than Mr. Ismay.

Dr. Pringle, the medical officer of the Manchester Port Sanitary Authority has just made known the result of an experiment with a patent disinfecting apparatus on board ship, which it is claimed will kill germs and rats without damaging the cargo. Dr. Pringle says that the trial took place on the Manchester City, and after the germeidal gas had been pumped through the ship, forty-five dead rats,—and no live ones—were found on the vessel. The ship was empty and of course many of the rats had cleared with the cargo. He suggests the advisability of an independent test and to try the effects of the gas upon fabrics and dyes.

The British first-class cruiser, St. George after being at Belfast over twelve months undergoing a complete overhaul of hull and machinery at the hands of Messrs. Workman, Clark & Co. left on Saturday for Portsmouth. The St. George is a comparatively new cruiser of the Crescent class, having been built in 1892. She is about 380 ft. long over all, with a displacement of 7,700 tons. The engines are capable of developing an indicated horse power of 10,000 under natural draft and 12,000 under forced draft, and steam is supplied by four double-ended and one single-ended cylindrical multitubular boilers. The protective deck, which protects the vital parts of the vessel, such as machinery, boilers, magazines, etc., extends fore and aft, with extra armor plating over the cylinders. The armament consists of two 9.2-in. guns, ten 6-in. guns, and twenty-four smaller guns; she has also submerged tubes for discharging torpedoes. The crew numbers 550 including officers. The overall has extended to the minutest details, and in addition there has been an entirely new electric installation fitted throughout, including motors for ammunition hoists. A new office and fittings for wireless telegraphy has also been fitted. The St. George had most successful speed trials three weeks previously, in which she maintained a speed of 21 knots per hour under natural draft for eight hours, the engines and boilers working smoothly throughout. This is in excess of any speed previously attained by the vessel, and is most satisfactory.

Rear Admiral George W. Melville, who is at present abroad making an inquiry into the turbine method of steamship propulsion, in an interview in Paris, reports that he finds a lack of attention among naval engineers both in Germany and in Great Britain to this type of engine. The naval experts in England are confining their experiments to one small steamer, but expect that the proposed turbine Cunarder will furnish an important lesson in the suggested application of the system to warships. The admiral found the experts of various nations agreeing that the chief defect of the turbine is the necessity for using small propellers. Admiral Melville is of opinion that it will require fifteen years further experiment before the turbine engine is developed to a practical basis for use on board ocean liners and warships.

Gardner & Cox, 1 Broadway, New York have sold the steam yacht Cangarda, owned by Chas. J. Canfield of Manistee, Mich., to Mr. Willis T. Hanson of Schenectady, N. Y. This yacht was built by the Pusey & Jones Co., Wilmington, Del. from designs by H. C. Wintringham. She was launched in 1901 and is 130 ft. over all, 105 ft. water line, 17 ft. 9 in. beam and 7 ft. draught. She is equipped with triple-expansion engines, 9 14½ and 24 cylinder diameters by 14 in. stroke. Steam is supplied by an Almy water-tube boiler. It is the purpose of Mr. Hanson to use the yacht on the St. Lawrence river. The Cangarda is a very commodious and handsome craft.



EFFECT OF EXPLOSION OF SUBMARINE MINES.

SCOTCH SHIPPING LETTER.

Glasgow, March 10.—The launch of the first-class armored cruiser Argyll aroused widespread interest in Greenock. On upwards of a score of occasions Scott & Co. have carried through important contracts for war vessels, although most of them have been for machinery. The Argyll is one of the six armored cruisers of the County type. Her displacement is 10,700 tons, her horse power 21,000 and her speed 22 knots. At 12:50 p. m. the ceremony of naming the vessel was performed and fifty-eight seconds later she was clear of the ways and had settled erect in the water. An interesting ceremony followed, when the new dock which Scott & Co., have constructed alongside the launching ways of the Argyll was formally opened and received as its first charge the new cruiser. The new dock will not, however, be completed for two months, and arrangements have been made for berthing the Argyll temporarily in James Watt dock. At the usual lunch which followed the launch (somehow no launch is complete without a lunch) Admiral Wilson, on behalf of the navy, said he had been particularly requested by a lady to explain the difference between a battleship and a cruiser. In the days of the old wooden ships the difference between the battleship and frigate was almost exactly the same as existed now between the battleship and the cruiser. The object of the battleship was to fight in the line of battle, and for that she required the heaviest guns and armament that could be put in her; but high speed was not a necessity. In the case of the cruiser speed was the very first consideration. Cruisers such as the Argyll were, he said, the fastest and most powerful afloat at the present time, and when they were wanted in any distant part of the world they would get there more quickly, and do more damage when there, than any other fleet of cruisers built.

Mr. R. Sinclair Scott said that when a little more than

a year ago, the lords commissioners of the admiralty entrusted his firm with the responsibility of constructing that great vessel, it afforded considerable satisfaction to a large section of the community. They had arrived now at the second stage towards her completion, and the result of the launching had been entirely satisfactory. She had been built from the designs of that eminent naval architect the chief director of the navy, Mr. Philip Watt. Provost Anderson of Greenock reminded the guests that the firm of Scott & Co., was not of yesterday, and that the partners present represented the sixth generation of ship builders in the town of Greenock. For the long period of 200 years Scott & Co. had been engaged in the industry of ship building there. Even when wooden vessels were in use they were recognized by the admiralty, and for 150 years they had been doing work for the government of the country. In the year 1889 they equipped two important gunboats for the admiralty—one named the Thrush which was commanded by Prince George, now Prince of Wales and heir apparent to the throne. The name Scott was an honored one and he hoped that in successive generations they would continue to perform important work as ship builders. Mr. Charles C. Scott, in his reply, said that in 1803 there was constructed in Greenock a sloop of war called the Prince of Wales. In 1903 they fitted engines to a government vessel of the same name, which was something of a coincidence. Another interesting launch was that in 1849 of a frigate named after the town of Greenock. She and her sister vessel, the Simoon, built at Napier's were the first vessels constructed of iron to be passed into the navy. Sir William Arrol referred to the progress made by the firm, and paid a high compliment to the energy of Mr. Sinclair Scott. There was no place in the world, he believed, better

situated for the building and repairing of vessels of war than Greenock.

LAW OF COLLISION AND SALVAGE AT SEA.

The Glasgow Ship Owners' Association and Glasgow Chamber of Commerce have taken part in a deputation to the Foreign Secretary on the subject of the law of collision and salvage at sea. The government of Belgium having proposed to the various powers that they should take the necessary steps for adopting a uniform law as to collisions at sea and salvage, this deputation waited on the Marquis of Lansdowne at the foreign office with the view of inducing the British government to join in a conference. It is understood that the United States, France, Russia, Austria-Hungary, Italy, Norway and Sweden, and Japan have already accepted, and that the Hanseatic cities are also favorable. Lord Lansdowne received the deputation but, as previously notified, the proceedings were in private. I learn however, that Mr. C. McArthur, M. P., in introducing the deputation, referred to the progress of the efforts made to promote uniformity of maritime law. Conferences had been held on the subject at Antwerp, London, Paris, Hamburg, and two draft codes for a uniform law as to salvage and collisions at sea had been compiled. The Belgian government had proposed that a further conference should be held. The Chamber of Commerce for the ports felt that something should be done to remedy the divergences between the laws of different nations on these questions. Foreign nations were always ready to recognize the leading position and paramount interest of Great Britain in such matters. Sir. T. G. Carver, K. C., described how the two codes in question had been prepared at meetings attended by lawyers and experienced shipping and business men. There might have to be a change in British legislation to amend the law of collision in cases where the navigators of both ships were to blame, or where the collision was due to the fault of a compulsory pilot; but the salvage code had been drawn substantially on the lines of English law. The deputation asked that the government should consider these codes as it was very desirable that the voice of Great Britain should be heard at the conference. There was a general consensus of opinion at all these conferences that something should be done, and there was no other course open except that which had been followed. Mr. W. F. G. Anderson (of the Anchor Line) representing the Glasgow Ship Owners' Association, the Glasgow Chamber of Commerce, and the Chamber of Shipping of the United Kingdom, pointed out that there was unanimity among business men upon the matter. The question of ship owners' liability was also very important, although it was not dealt with by the codes submitted. Sir John Glover, on behalf of the British Ship Owners' Society, said the ground had now been so thoroughly prepared that there could be no harm in the British government sending representatives to the proposed conference, whilst at the same time retaining a free hand with regard to its conclusions. Mr. De Rougement said that Lloyd's of which he was chairman, had not yet had time fully to consider all the proposals made in the draft codes, but they were of opinion that uniformity in the maritime law of different nations was most desirable. Lord Lansdowne, in reply, said he would not touch on the technical aspects of the case. There was no difference in policy between the deputation and himself as to the desirableness of attaining uniformity of law. The only question was as to the best means. The British government had up to the present time refused to take part in conferences to discuss this matter, but their reluctance was due to an anxiety not to take any step which would bind or hamper the vast shipping of this country. We were a large maritime state, yet at the conference we would only count the same as a small state with limited shipping. He understood from the deputation that the ground had now been prepared fully by previous discussions, and that it was ripe for an official conference. The draft codes would be carefully considered, and his decision would, as early as prac-

ticable be communicated to the deputation. He was fully sensible of the authority and weight of the present deputation, and regretted the lord-chancellor had been unable to attend.

RUSSIA IS ORDERING SUBMARINES.

The Russian navy is deficient in submarine torpedo boats; but now orders have been issued for six of these boats to be constructed at St. Petersburg on the Djevetsky system, in connection with which various experiments have already been made. They are to be 77 ft. long and 14 ft. beam with a gasoline engine to drive the vessel on the surface, and electric motors to use, when submerged, in combination with accumulators. The torpedo launching apparatus is designed that the torpedo can be directed immediately after it has left the tube. The question remains whether these boats can be sent by rail to the far east, but the Russians have already sent eastward several torpedo boats in sections. Submarine boats require to be of very light scantling, and French naval experts have discovered that their boats are too light to withstand the strains of railway transit across France, from Cherbourg to Toulon. Two of the Cherbourg submarines were to have been sent across country to Toulon to be embarked on board the carrying and repairing ship *Foudre*, to be taken by her to the far east, but the *Foudre* will now have to go to Cherbourg for them. Six of these boats are to be sent to the far east, two at a time. With one exception these vessels are 77 ft. long by 7.6 ft. in diameter, displacing 68 tons. They are driven by one screw which gives them a speed of 8 knots. The sixth vessel is a submersible—the *Aigrette*, newly completed at Toulon. Her length is 117.6 ft. diameter 12.5, and displacement 172 tons. She has a speed of 10½ knots on the surface. Japan may build some of the American-Holland boats in three months, and the absence of submarines from the Japanese fleet is regarded as the one defect in their naval plans.

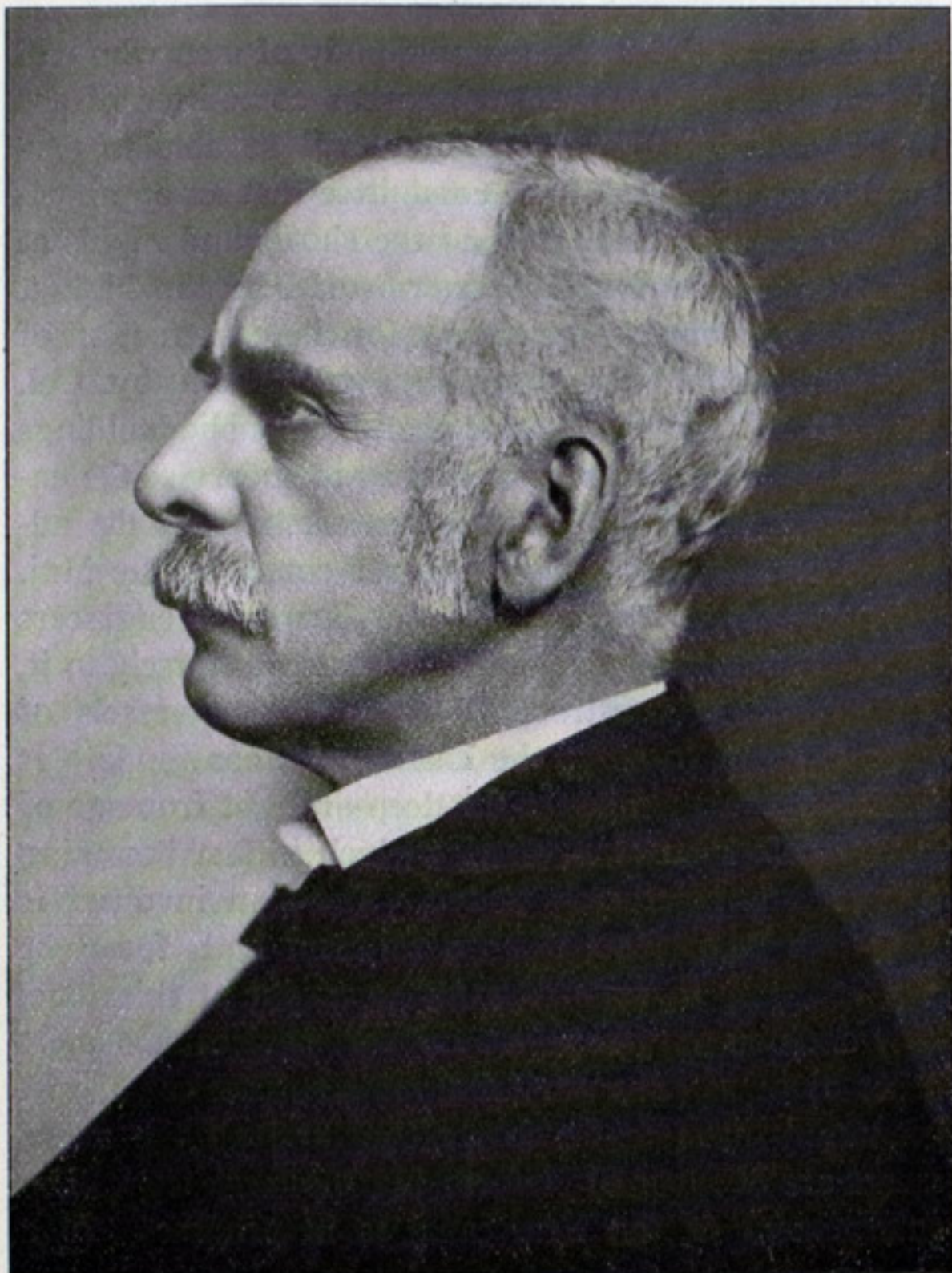
The new Durban floating dock, which, as I stated in a former letter, duly arrived at Natal after one of the longest tows on record, is unfortunately found to be damaged. After the dock had been surveyed on arrival it was discovered that the center pontoon was slightly leaky amidships; the fore pontoon was leaking forward; the port wall was indented; and the internal parts were damaged. The cost of repairs will be about £3,000 but there is urgent necessity for the dock. Durban harbor has been so long lacking in docking facilities, that the Natal government ordered this floating dock to be finished and delivered with all possible dispatch. The previous pontoon dock was wrecked on her way out. The harbor authorities may, therefore, undertake the repairs themselves. The insured value is £110,000, including the floating workshop in connection, and underwriters' risk does not cease until the vessel's machinery enables her to fill, sink, pump out, and raise properly, so that a ship can be efficiently docked; and this must now be delayed for several weeks.

As to armored cruisers, the Australian class in the British fleet in 1886 cost £60 per ton, while the vessels of the Duke of Edinburgh class of today, with their larger gun power, cost £83 10s per ton. The French modern armored cruiser, *Dupuy de Lorne*, in 1800, cost £55 per ton, while the *Renan* of today has cost £96. Russia paid over £100 per ton for her latest armored cruisers as compared with £67 for those built twelve years ago. The cost of the German moderate-sized modern armored ships of the *Deutschland* class is £96 12s per ton, but Germany had no vessels twelve years ago with which comparison can be made. The United States will pay £90 per ton for their new 14,500-ton cruisers. Britain's advantage in cruisers is greater than in the case of battleships, roughly between 40 and 50 per cent.

The battleship *Wisconsin* has beaten the world's record with its 13-in. guns. Its expert gunners made nine bull's eyes out of ten shots fired within ten minutes.

THE GOVERNMENT SHOULD AID SHIPPING.

One of the public officials who does not hesitate to speak his mind is Secretary Leslie M. Shaw of the treasury department. It has been known ever since Secretary Shaw entered office that he is entirely in sympathy with the movement for the upbuilding of the American merchant marine. He has frankly met every one who has appeared before him on that subject; moreover, he has amazed a great many men, steeped



SECRETARY LESLIE M. SHAW.

all their lives in the business, with the intimate knowledge which he possesses of every phase of maritime endeavor. During the past year he has made a number of speeches in favor of aid to the American ship. Recently before the bankers of Philadelphia he made an address upon the toast "Our American Marine." What he thinks is best conveyed in his own words. He said:

"In proof of the fact that the American people are becoming interested in international transportation facilities, I have only to cite the fact that at the present session of congress nearly a score of bills have been introduced for the avowed purpose of encouraging the growth of our merchant marine. The American people are not proud of the fact that while the United States ranks first in natural resources, and in developed resources with a larger foreign commerce than any other nation, save one, she stands at the very foot of the list in her facilities for transporting these resources to the ports of other countries. Those who advocate a subsidy are accused of being in league with a shipping trust. There is no shipping trust, except it be in the ownership of vessels built in foreign yards, of foreign materials, with foreign labor and foreign alien colors. These cannot participate in an American subsidy. Do not understand me as intimating the only way to secure a merchant marine is by means of subsidy. I do desire to be understood, however, as favoring merchant marine. And it is a demonstrated fact that a merchant marine will not grow as weeds grow. Our manufacturing interests

have been developed under the fostering care of the government. Our trans-continental railroads are the fruit of wise, though severely criticised, legislation. We are fast acquiring a navy to be proud of, and are fast becoming proud of the navy we have. Yet the American people are willing to pay the price—I believe that they are willing to pay—the price of a merchant marine. Let us hope that before congress adjourns a committee will be created to investigate the subject. Let us hope that at the convening of the next session this commission will file a well-considered report. Let us hope that thereupon such action will be taken as in the wisdom of congress shall be deemed appropriate. The end is of such far-reaching importance as to justify the most painstaking investigation and the most fearless statesmanship."

LAUNCH OF FERRY BOAT ELLIS ISLAND.

The ferry boat Ellis Island, building at the yard of the Harlan & Hollingsworth Co., Wilmington, Del., for the immigration bureau of the department of commerce and labor, to run between Ellis Island and the Battery, New York, was launched on Saturday afternoon last and was named as she slid down the ways by Miss Sargent, the daughter of the commissioner general of immigration. The vessel is 160 ft. over all, 45 ft. beam, 15 ft. 3 in. deep, and is designed to develop a speed of 14 miles an hour. The hull is of steel with double bottom extending between collision bulkheads. The engines are two-cylinder, surface-condensing compound, working a screw at each end of the vessel, and the boilers are of the Scotch type for 135 lbs. working pressure. She has a cabin on the main deck and one on the upper deck. The main deck is enclosed, forming one large cabin, with a toilet room on either side. Above this is an upper cabin for the employees. Pilot houses are fitted at each end of the boat with a commissioner's room at the boiler end. The vessel is provided with hand and steam steering gear and is equipped with a complete electric light plant. The floors are covered with interlocking rubber tiling.

Quite an affair was made out of the launch, the following list of guests attending: Hon. George B. Cortelyou, secretary of commerce and labor; Hon. L. O. Murray, assistant secretary of commerce and labor; Hon. E. T. Chamberlain, commissioner of navigation; Hon. George H. Uhler, supervising inspector general steamboat inspection service; Hon. L. Heisler Ball and Hon. J. Frank Allee, senators from Delaware; Commissioner General of Immigration and Mrs. F. P. Sargent, and Miss Sargent; Mr. L. T. Weis, commissioner of immigration, of Baltimore; Hon. James Smith, Jr., receiver of the United States Ship Building Co.; Lieut. Com'r. Alfred Brooks Fry, Mr. William Williams, commissioner of immigration, Ellis Island; Hon. William McAdoo, Mr. George R. Sheldon, Mr. Max Nathan, Mr. Charles S. Fairchild, Mr. C. W. Wetmore, Mr. John E. Borne, Mr. Pliny Fisk, Mr. W. W. Lee, Mr. Thos. F. Ryan, Mr. W. J. Curtis, Mr. Stuyvesant Fish, Mr. George C. Bokdt.

A meeting of the bondholders of the Fore River Ship & Engine Co. was held in the office of Kidder, Peabody & Co., Boston, last week, to consider the future needs of the company. The company desires \$1,400,000 for the purpose of paying off a floated indebtedness of \$600,000, to add to its plant at a cost of \$300,000, and to provide \$500,000 of working capital. Mr. S. N. Aldrich, president of the State National bank of Boston, and S. Reed Anthony of Tucker, Anthony & Co. of Boston, were appointed a committee to consider plans for raising the new capital. This committee has power to add a third member from New York to represent the \$300,000 of bonds held in that city.

Capt. W. C. Richardson of Cleveland returned from a southern trip this week. He was gone five weeks.



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It is probable that the house of representatives will this week take up and pass the Gardner bill, which proposes the creation of a commission, consisting of five senators and five representatives, to investigate the subject of American shipping and recommend to congress at the opening of the short session in December a bill for its rehabilitation. This bill conforms to the recommendation made by President Roosevelt in his last annual message to congress, except that it omits from the makeup of the commission the three cabinet officers suggested by the president. The democrats of the merchant marine committee opposed the bill; they favor a plan of discriminating import and tonnage duties, while the republicans seem to lean to subsidies. Yet it is possible, and indeed quite probable, that a commission, after studying the subject with care, could agree upon a bill satisfactory to both the democrats and the republicans. If a bill could be framed that would command the support of both parties, and from the consideration of which partisanship could be eliminated, then the United States could start in upon the development of its merchant marine assured of the permanency of the policy adopted. Surely this is a consummation to be most devoutly hoped for by every friend of American shipping, and to be worked for, most industriously. Such a result would serve notice upon all the world that the maritime development of the United States was about to begin upon broad and enduring lines, and it would

soon be seen that the agents of foreign shipping in the United States were taking an infinitely more tolerant view of American shipping than ever before. Most of all, the nation would thus acquire a resource of national defense which all students of government and military experts agree is essential to the nation's true safety and independence.

It is hoped that the influential body of men who will appear before the river and harbor committee of the house of representatives Friday will be able to persuade the members of the committee that an appropriation for a ship canal around the shoals and rapids at the head of the Niagara river would be the highest form of economy. The survey for the construction of the ship canal was originally undertaken by Col. Thomas W. Symons, now in charge of public buildings in Washington, and who is shortly to supervise the enlargement of the Erie canal as a member of the advisory commission. His work was completed by Maj. Theodore A. Bingham, but the board of engineers which passed upon the project reported adversely to it. This canal, if constructed, would enable vessels of deep draught to enter the harbor of Tonawanda. It would add many miles to the deep-draught frontage of the Buffalo district, a district which is fast becoming a great manufacturing center. The sum involved is less than \$4,000,000. It would seem both foresight and economy to make this improvement at this time. Any decision adverse to the improvement cannot exert other than a temporary influence. The canal will eventually have to be constructed and all the arguments are in favor of undertaking the work now. The enlargement of the Erie canal is in progress. The construction of the ship canal would have a direct influence upon the utility of the enlarged Erie canal. Therefore one ought to be ready as soon as the other is in order that the greatest benefit might be secured from the Erie canal. The state of New York is expending \$101,000,000 in an effort to make the great lakes trade an all-American trade and to prevent the diversion of a large part of it to Canadian channels. If the state of New York is willing to expend \$101,000,000 to do this the federal government ought not to hesitate to expend \$4,000,000 to render the consummation of this end more certain.

June of next year will mark the semi-centennial of the opening of the first canal of Sault Ste. Marie to commerce. It is a pertinent suggestion that every interest identified with the lake trade write to the lake representatives and senators in congress to forward the adoption of the Alger resolution appropriating \$20,000 for a proper observance by the federal government of the semi-centennial anniversary of this canal. A better occasion for a great celebration could hardly be obtained. The canals at Sault Ste. Marie are in point of commerce by far the greatest in the world. They are so remote from the common center of popu-

lation that the great majority of people are doubtless ignorant even of their existence. Everyone, however, in the great lakes region recognizes their importance and should make it a point to see that it is also recognized by the nation. Were the vessel and other interests associated with the lake trade to write individual letters to Washington, it would do a great deal to facilitate the enactment of the necessary legislation. It would really be a pity to let 1905 go by without a fitting observance of the fact that it is just fifty years since navigation was established between Lake Superior and the lower lakes.

As a general rule the admission of foreign-built vessels to American register is to be combated. Wrecks are secured at low figures and by the addition of necessary repairs in an American ship yard are given American register, which entitles them to the privileges of the coastwise trade of the United States. However, the soundness of every rule is proved by the exception to it. Mr. F. W. Gilchrist of Alpena, Mich., is endeavoring to obtain register for the steamer Beaumont, formerly the Myra. Those who are familiar with the experience of this steamer since she went on the Cape Breton coast are quite willing to admit that she is entitled to American register. Her release from the rocks was a wrecking triumph. Both the wrecker, Mr. Reid, and her purchaser, Mr. Gilchrist, have had a great deal of trouble with her, and it was pretty thoroughly proved to the satisfaction of the congressional committee that the necessary sum had been expended upon her to entitle her to American register.

Occasionally a common stockholder of the United States Steel Corporation will break out into print in the New York newspapers demanding that the common stock of the great corporation shall be placed upon a dividend paying basis. Then will follow a perfect diatribe against the directors of the corporation for suspending the dividends, claiming that the stockholders invested in good faith and that therefore the suspension of the dividends is virtually a breach of trust. Occasionally a stockholder with a very few common shares will join the chorus and suggest that Mr. Carnegie pay the dividend out of his private funds. A third will accuse Mr. Carnegie of unloading his common stock upon a confiding public while it was at the highest market rate, oblivious of the fact that Mr. Carnegie never possessed any common stock whatever. His holdings are entirely in bonds. Now an attorney is endeavoring to compel the directors to pay dividends on common. The company would have to earn \$100,000,000 during the present year to pay a 4 per cent dividend on common stock, and earnings as large as this are now out of the question. In point of fact, the corporation made a great mistake in paying any dividend upon common stock at all. It has already distributed in the neighborhood of \$50,000,000 upon its common stock. The corporation

would be much more securely entrenched for the present lean year if that fifty millions had been credited to surplus.

The labor element has entered the field of controversy over American shipping in a manner to cause much embarrassment and confusion in the camps of the opponents of that industry. The free trade press of the country is endeavoring to connect the demands of the Brotherhood of Boiler Makers and Iron Ship Builders that congress shall give protection to American shipping equal to that given to other American industries with that of "the subsidy advocates." There is nothing upon which to base such an assertion. President John McNeil, of the organization in question, points out that 20,000 of the 30,000 skilled workmen who are members of his brotherhood are seeking work at their trade. He states that they cannot obtain work because the ships employed in our foreign trade are all built abroad. He distinctly says that neither he nor his associates are concerned as to the manner by which American workingmen are given the work of building the merchant shipping employed in our foreign carrying, so long as they get it. And this is the kind of talk that the free traders interpret as favoring "the subsidy advocates." The free traders can only tell President McNeil and his brotherhood that they should work for the same wages that are paid in foreign ship yards, but this President McNeil emphatically asserts they will not do. This being so, of course he must be "a subsidy advocate." President McNeil states that he and his fellow members want the American wage scale and the American standard of living, and that they are as much entitled to it as the men employed in factories whose products are protected against foreign competition, and which protection affords them the high wages they receive. There is no answer to this kind of talk except free trade and lower wages, and it is no wonder that the free traders, both in and out of congress, are disconcerted that such a demand should arise in the ranks of labor in a year when the influence of labor upon political policies is so potent.

A vigorous fight is now being made in congress to designate in various bills a special type of submarine boat. Obviously this is unfair. The secretary of the navy should be given authority to select whatever type he pleases. The submarine by no means has reached its final development and there is no sense in confining choice to one type.

It seems that even in high places petty jealousy must obtain. Owing to the fact that certain senators and representatives could not agree upon a site for a naval station on the great lakes, each one wanting it located where it would redound more to his personal credit, the appropriation for the purchase of a site has been left out of the naval bill altogether.

TUGMEN VIOLATED THEIR AGREEMENTS.

Some little time ago a conference was held in Cleveland between Mr. Harry Coulby, representing the Great Lakes Towing Co., Capt. Bush, representing the Licensed Tugmen's Protective Association, and President Livingstone of the Lake Carriers' Association, to arbitrate certain matters arising out of the trouble of the towing company with its tugmen last year. Mr. Livingstone was selected by both parties to the controversy as arbiter. After all the testimony was in he took the matter under advisement and has just delivered his opinion. Many minor issues were considered by the conference, but the principal one was this: When the steamer Glidden was sunk in the ship canal in Lake St. Clair Flats last fall, Mr. Coulby, as the general manager of the towing company, sent three tugs from Cleveland to assist in removing the wreck. Double crews were in each instance furnished each tug, making six crews in all. The removal of the tugs from Cleveland crippled the service somewhat, and fearing that the remaining tugs might not be able to perform their duties, Mr. Coulby ordered the tug Sunol from Ashtabula to Cleveland. The Sunol was manned by members of the Licensed Tugmen's Protective Association, but when she got to Cleveland, the Cleveland men declined to allow her to work. During the three weeks of her stay in Cleveland she never turned her wheel. The towing company held that in transferring the tug from Ashtabula to Cleveland they had done all that could be expected of them, and that as the tugmen of Ashtabula and Cleveland were both members of the same association, it was a matter which they should settle among themselves. The tug, however, did not work during her entire stay in Cleveland.

In the course of time the three tugs sent to the ship canal returned to Cleveland. They got in on a Friday afternoon. About six o'clock that evening when orders were sent to Capt. Coulter of the tug Frank W., it was found that he had left the tug. A little later the crews of the three tugs quit and were discovered holding a conference on Superior street. They claimed that they had a grievance to the effect that they were entitled to every third night off and every third Sunday off, a privilege which, of course, they did not enjoy while in the ship canal and which they proposed should now be given to them. At this time Mr. Coulby was in Buffalo, but he was communicated with over the telephone. He declined to treat with the men until they returned to work, holding that they were violating section 5 of the agreement with them, which reads: "All complaints, objections and questions arising under this agreement that cannot be adjusted between the parties hereto, will be arbitrated in the usual way, men to continue at work pending such arbitration." After five days of persuasion the men were apparently brought to realize that they were violating their own agreement by suspending labor, for on the Thursday night following they returned to work. It was contended by the towing company that the men were not entitled under the agreement to have every third night off and every third Sunday off, because section 12 of the agreement specifically provides that only tugs carrying single crews shall have this time off. As stated, the crews were in this instance double crews. Incidentally during the trouble, Capt. Dwyer of the Canada, who was too tired to work for the towing company, went aboard one of the opposition tugs and worked all night. He was, of course, suspended by the company, but later when the matter was presented to Mr. Coulby he ordered Dwyer to go back to work with the understanding that he was not to receive pay for the balance of the season if the arbitration board proved him to be guilty. These were the main questions considered by Mr. Livingstone. He very promptly decided against Capt. Dwyer and also against Capt. Coulter. He also decided that the men were not entitled to time off when the tugs returned to Cleveland, because of the specific language of section 12, which confers this benefit only upon single crews. Upon this statement his language is: "I

was present during the entire time that the present contract was made last spring and heard all the discussions pro and con, and there is not a shadow of doubt in my mind that it was the intent and understanding of the agreement at that time that only tugs carrying single crews were entitled to lay off time. Where double crews are carried it means that the men are supposed to render twelve hours work each day for thirty days in each month."

The arbiter's decision was against the men in every account except one, proving conclusively that they violated their own agreements.

Other matters of less importance were also threshed out. Capt. Vosborg of the tug Lutz was found guilty of negligence in towing the Buffalo boat into the harbor. There were extenuating circumstances in this, however, as Capt. Vosborg frankly admitted his blame. He went out to the breakwater to look for the boat and could not see it. The weather was rather thick and he thought he had ample time to eat his breakfast. He stepped into the cabin to do so and when he had finished found that the boat had passed and entered the harbor. The arbiter holds this to be a mistake of judgment and not of intent.

Capt. Robertson of the tug Goulder was held guilty of non-performance of duty in refusing the request of the captain of the schooner Senator to tow into Cleveland by telling the captain that his tug was bound for Lorain for tow. Upon this point the arbiter holds that the evidence showed that Capt. Robertson did not perform his duty. The arbiter says: "The duty of every captain employed by the tug company should be to work for the interests of the employer and every captain does or should at least thoroughly understand that it is his duty to do everything that he can legitimately do to further the interests of his employers in aiding them to do business and consequently increase the earnings of his company. The captain who does not thoroughly understand this and act accordingly is unfit for the position he occupies. The evidence in this case showed that Capt. Robertson grossly neglected the interests of his employers, and still further aggravated it by the fact that he told a deliberate falsehood to avoid doing the work."

FLOATING DOCK FOR GREAT LAKES TOWING CO.

The Great Lakes Towing Co. has given an order to the American Ship Building Co. for a floating dry dock to be 76 ft. long, 43 ft. beam and 6 ft. deep. It is the purpose of the towing company to locate the dock at Fairport. The dock presents many novelties in construction. Instead of having the sides carried continuously from one end of the dock to the other, there will be a couple of towers in the amidship part of the dock. The advantages are that it reduces the expense of construction and increases the facilities of the dock. When the dock is established at Fairport, which will be in about two months, the towing company will be entirely self-contained as far as repairs are concerned. At present the company has a very complete machine shop at Fairport, capable not only of caring for the tugs but of also doing work upon other vessels. The company expects gradually to develop its mechanical resources to the end that it may build its own fleet. It is quite likely that a new steel lighter, somewhat bigger than the Newman, will be built during the present year for the company. The new lighter will differ from the Newman in that she will be sharp at both ends and will be adapted for open water work. The Newman, which has made a record for economy and dispatch in lightering, is primarily a river boat. While the contract has not been let for the new lighter it is more than likely that it will be built during the present year. Mr. Coulby, during the brief time that he was president and general manager of the towing company, did a great deal for the company as a physical property. It is in better condition now than it has ever been, there is money in the treasury and the company looks forward to a prosperous year.

LAKE FREIGHT SITUATION.

It is not now expected that there will be any movement of freight to speak of on the great lakes during April. None of the vessel owners appear to be giving the subject any consideration and are not disposed to hurry. It will probably be about two or three weeks yet before agreements will be concluded between the longshoremen and the dock managers. The longshoremen are meeting at Cleveland during the present week to formulate a scale of wages for the season. They are likely to continue at it during the balance of the week. The dock managers will meet next week to consider the schedule. The vessel owners are disposed to think that the present unloading rate is too high. They believe that there should be some reduction from the rate of 21 cents which obtained last year.

Of lake trade it is undeniably true that those best informed are frequently the wildest in their forecasts; but none is so bold as to take an auspicious view of it now. The common opinion appears to be that from 14,000,000 to 15,000,000 tons of ore will be moved during the present season. Of course, if the season drags on before the movement of ore is started it may prove a fair one from the vessel owner's standpoint after all, for the reason that while the tonnage available is ample to move twice this quantity, the docks would be worked well up to their maximum capacity, and that, therefore, prompt dispatch could not be obtained. There is no talk whatever of rates as yet.

Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., the lake end of the Steel Corporation, returned from Duluth this week. He says that ice obtains at the head of the lakes as far as the eye can see, and that there is no prospect of an early opening of navigation. No efforts have been made to meet representatives of the different labor organizations, and a discussion of the wage schedule on board ship is likely to go over until April. Mr. Coulby makes no secret of the fact that he does not view with favor an organization of masters. He believes that the masters should be the representative of the owner on board ship and not the representative of an association.

NO DEMURRAGE ALLOWED THE IONIA.

In the case of the *Ionian Transportation Co., vs. 2,098 tons of coal*, Judge Seaman in the United States district court of Wisconsin has held that the libel for demurrage is without support. The circumstances are these: A libel for demurrage was charged alleging unreasonable delay in discharging a cargo of coal, under charter for delivery at "Clancy's dock," port of Racine, with no terms stated as to discharge. The rate was 60 cents per ton, being 10 cents in excess of the current rate to Milwaukee, Sheboygan and Manitowoc, and the master states, as the ground for such excess, the insufficiency of channel at Racine for the general class of coal carriers. The facts which are material upon the primary issue of liability are undisputed, namely: The steamer *Ionian* received the cargo at Toledo, Oct. 24, 1903, and arrived at Racine about noon, Oct. 29, when due report was made to the consignee. Arrangement for discharge at Clancy's dock had been made by the consignee, and that was the only coal dock at the port which was open to such service. The steamer *Marina*, laden with 3,200 tons of coal for the dock owners, was then at the dock in course of discharge, and was not unloaded until the evening of Nov. 10, when the *Ionian* moved in to her berth; but discharge was not commenced until Nov. 11, at noon, owing to needful change in the dock equipment from "clam shells" to buckets; and discharge occupied four working days. The causes for these delays were: When the *Marina* arrived, about ten days in advance of the *Ionian*, the owners of the dock were engaged in changing the equipment from buckets to the clam shell system, under contracts which they claim were not duly performed as to time or

character of work, so that discharge of the *Marina* could not be commenced until Oct. 28; and the time then required for discharging was at least double the usual time with the old equipment, due solely to defects in the new equipments. For unloading the *Ionian* it was deemed best to resume use of the buckets, and the change delayed its commencement, but the work was pushed and discharge expedited, so that the only objections raised in that particular are, (1) the fact that defective clam shell equipment intervened, and (2) the fact that the electric lighting system of the plant, destroyed by fire shortly before the arrival, was not in use, thus shortening the working hours. This aggregate detention caused damage to the libellant when the lay days were of special value for making another trip before the close of the season, and occurred without fault on the part of the libellant. The respondent is equally free from fault, unless chargeable with the conditions referred to which were found at the dock.

The decision of District Judge Seaman was as follows:

"The doctrine is well settled that the right to demurrage for failure of a shipper to promptly deliver the cargo, or of a consignee to promptly discharge it on arrival, rests upon the charter or affreightment contract, either in express or implied terms. Time is an element of special importance in such contracts, and it is well remarked that 'a vessel should ordinarily have prompt dispatch, for such is essential to her profitable employment.' (*Corrigan v. Iroquois Furnace Co.*—C. C. A.—100 Fed. 870), so that stringent terms for lay days are not uncommon in bills of lading. The right to exact such terms is recognized and the authorities are harmonious for strict liability of the shipper or consignee in the event of breach. When no such express provisions appear in the contract the modern authorities concur in the view that an implied obligation arises on the part of the consignee for reasonable dispatch, but they are not harmonious in the rule which governs the issue of reasonableness. As expressed in one line of opinions and by distinguished maritime authorities, this implied liability of the consignees is absolute for delay beyond the customary requirement at the port of discharge, 'although no blame is imputable to them, provided the owner (or vessel) be not at fault;' (1 *Parsons on Shipp. and Admir.* 314; *MacLachlan on Shipping*, 3 Ed. 523); while the other line excuses the consignee from such liability when the delay is not voluntary, but arises from circumstances beyond his control. *Empire Transportation Co. v. Philadelphia, etc., Coal and Iron Co.*, 23 C. C. A. 564, 571, 77 Fed. 919, and cases reviewed.

"In the case at bar the causes of delay were obviously beyond the control of the consignee and solution of the issue rests upon the adoption of one or the other of the lines of decision referred to. I have examined the cases cited in support of the broad contentions on behalf of the libellant, with others bearing upon the interesting question, but the opinion in *Empire Transportation Co. v. Philadelphia, etc., Coal & Iron Co.* with its well considered review of the authorities, impresses me as stating the true rule to be applied when the contract is silent as to lay days or dispatch; and this view is strongly fortified by its approval in the opinion by Judge Jenkins, speaking for the circuit court of appeals, in *Corrigan v. Iroquois Furnace Co.*, 41 C. C. A. 102, 104, 100 Fed. 870. While the last mentioned case is not directly in point, the statement of the rule as to reasonable dispatch—'that reasonable time is determined by the circumstances surrounding each case'—citing the *Empire Transportation Co.* case, *supra*, is clearly pertinent. The doctrine for which the libellant contends implies an undertaking by the consignee as an insurer against delay from any cause not attributable to the vessel, and I am of opinion that no such obligation is incurred without an express provision in the charter to that effect. With such terms liberally construed and strictly enforced no just ground appears for further liberality in favor of the vessel

by raising an implied liability of like effect, when the express provision is voluntarily omitted. The question is not presented upon this record whether the consignee is bound to inform the vessel owners of local conditions, known to him and to them unknown, from which unusual delay in discharging the cargo appears to be probable or inevitable, for the reason that the conditions were not of such character, if known to the consignee, that delay must have been thus foreseen. Consideration, therefore, of duty in that regard is not involved.

Finding no delay chargeable to the respondent the libel upon that ground is without support. Upon the further cause stated for unpaid freight the amount claimed is tendered by the answer and the money deposited in court. The libellant will be allowed this amount with costs to the date of such tender, and the respondent will recover its costs upon the demurrage issue. Let decree enter accordingly.

"NOTE.—Since filing the above opinion recent English cases have come to my attention, which disapprove the earlier decisions, on which the authors of the text books mentioned in the opinion predicated (in part at least) the rule of absolute liability, and adopt the rule and test of reasonable dispatch upheld in this opinion. The cases are *Postlethwait v. Freeland* (H. of L.), 5 App. Cas. 599, and *Lyle Shipping Co., Ltd., v. Corporation of Cardiff* (C. of A.), 2 Law Rep. Q. B. D. 638, with review of authorities. In the former it is said the duty of the consignee 'is not absolute, but to do his best.' The last mentioned case states that the rule was unsettled prior to *Postlethwait v. Freeland*, but that the test of reasonable dispatch as thereby established was 'not a hypothetical state of things'—not 'an ordinary state of circumstances'—but 'the actual state of things at the time of discharge.'"

TO UNITE OWNERS OF SMALL VESSELS.

The following letter has been sent to a number of vessel owners by a prominent vessel man: "Don't you think the men that have the smaller class of tonnage ought to get together with a view of bettering their condition, and in case they join the lake carriers have a representation so they can get the proper classification for their tonnage, also in reference to towing, etc. The handling of the lake carriers is getting practically in the hands of the owners of the larger boats, and the only way the owners of the smaller boats can have any voice in the matter is by being united."

This letter is to be considered as the first real effort to unite the owners of small vessels independently. As to how far the movement will go is yet to be determined. It has been known for a year or more that the owners of the smaller vessels have felt that they were not getting proper consideration from the Lake Carriers' Association. Especially was this true last year when the same schedule of wages was made to apply to all vessels, regardless of their carrying capacity. It is represented by those who are pushing the present movement that 75 per cent of the tonnage enrolled in the Lake Carriers' Association is controlled by the railway lines and the steel-making companies, and that the other 25 per cent belongs to the purely vessel owning interests. It is further represented that there is no common ground upon which these two interests may meet. In point of fact, their interests are frequently diametrically opposed to each other. The movement, of course, is very much in embryo at present, but a new association to embrace the smaller vessels has been hinted at. The advantages of such a course are represented to be as follows: That the new association could work in unison with the Lake Carriers' Association for objects of common interest, but that it would not be morally bound to be governed by the action of the larger body when it felt such action to be inimical to its interests.

SETTLEMENT WITH THE TUGMEN.

The dredging interests have finally come to an agreement with labor for the season of 1904. After a conference of several days' duration with the Licensed Tugmen's Protective Association and the Linesmen & Firemen's Association at Toledo, an agreement was finally reached. The wage schedule for the season will work out at practically the same figure as last year, except that there are certain modifications in it. Last year tug captains on Lake Erie got \$125 a month and on Lake Huron \$120 and \$110, according to the size of the tug. This classification has now been abolished and a uniform rate of \$120 a month has been established for all of the lakes. This raises the second class on Lake Huron \$10 a month and reduces the Lake Erie tugmen \$5 a month. This schedule will effect all ports except South Chicago and Chicago, where last year's schedule will practically obtain, though a slight reduction has been made in the wages of South Chicago tugmen. Concerning the right to discharge a man at any time during the year, which was denied the owners by the tugmen, a compromise has been effected. The owners have the privilege of removing a man and employing another in his place, but if the arbitration board proves that he has been wrongfully removed, he is to be reinstated. This is a virtual victory for the owners in that it reverses the conditions of the original demand. It makes the employe prove that he was discharged without cause instead of requiring the owners to prove that they had cause to discharge him. The tugmen will work thirteen to fourteen hours a day, according to circumstances. Settlement was made with the dredge men some time ago. They work twelve hours a day at last season's rate of wages.

SHIP CANAL AROUND NIAGARA RAPIDS.

An important meeting will be held in Washington on Friday of this week by the river and harbor committee, to consider the proposed ship canal around the rapids and shoals of the Niagara river in order to extend deep-draught navigation to Tonawanda. Among those who are scheduled to appear before the committee are Attorney General John Cunnene, State Engineer Edward A. Bond, Harry Coulby, president of the Pittsburg Steamship Co. of Cleveland; Col. Livermore of Boston, William Livingstone, president of the Lake Carriers' Association; Harvey D. Goulder, counsel for the Lake Carriers' Association; John G. Milburn of New York; J. J. Hill, president of the Great Northern railroad, and the following gentlemen from Buffalo: Harvey L. Brown, W. Cayrl Ealy, William H. Gratwick, Maurice B. Patch, George A. Ricker, John W. Robinson, Frank A. Dudley, Francis V. Greene, William B. Rankine, George P. Sawyer, William A. Rogers and J. J. H. Brown.

The estimated cost of this improvement is \$3,473,239. The improvement will enable all classes of vessels to pass from Lake Erie into the natural harbor of the Niagara river and will very widely extend the harbor line of the Buffalo district. There is also another point not to be overlooked. It will have a direct influence upon utility of the Erie canal. As long as the single state of New York is going to spend \$101,000,000 to improve the Erie canal, it would seem as though the federal government ought not to hesitate at an expenditure of between three and four million dollars to greatly increase the usefulness of this waterway. The board of engineers for rivers and harbors has reported adversely to the project, but it is hoped that the arguments of the lake interests before the river and harbor committee will outweigh their adverse report.

LAKE SHIP YARDS.

The package freighter building at the Wyandotte yard of the Detroit Ship Building Co. will be launched about April 20.

The passenger steamer *City of Benton Harbor*, building for the Graham & Morton Transportation Co. of Chicago, was

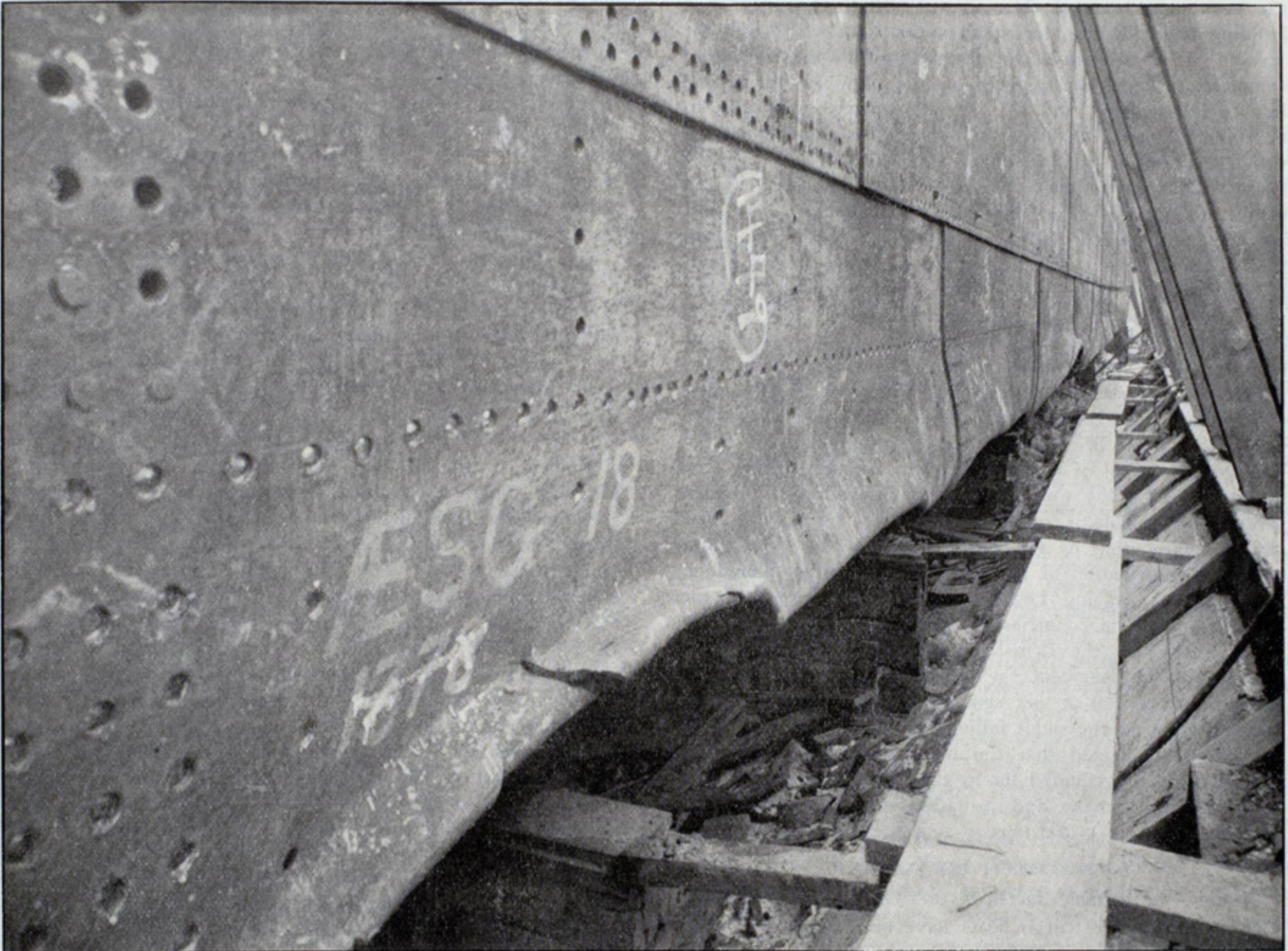
launched at the yard of the Craig Ship Building Co., Toledo, last week. The new steamer is 265 ft. long, 43 ft. beam and 14 ft. deep.

The new steamer Augustus B. Wolvin, which will be the largest steamer ever constructed on the great lakes, will be launched from the Lorain yard of the American Ship Building Co. on April 9. She is 560 ft. long and is exceeded in length by only twenty-two ocean liners.

The steel passenger steamer Missouri, building for the Northern Michigan Transportation Co. was launched last week from the yard of the Chicago Ship Building Co. at South Chicago. The steamer was christened by Miss Gladys Wilbur. The Missouri is 225 ft. long, 40 ft. beam and draws 12 ft.

CONDITION OF ICE IN THE LAKES

The reports of the ice condition from the regular and display stations of the weather bureau indicate that there has been no material change in any of the lakes. In Superior the ice is reported apparently solid over the western end; with more open water off Keweenaw point, where the fields are moving with the wind; no movement of ice fields over the eastern portion. Green bay remains solid. In Lake Michigan the fields continue along the western shore, but are not as extensive as last week. At the straits the conditions remain about the same with some snow on the ice. Lake Huron ice fields extend beyond vision, although some open water was visible off Middle island during the week; the bridge at the



LOOKING AFT ALONG THE STARBOARD SIDE OF STEAMER JOHN T. HUTCHINSON.

of water when loaded. She will run on the route between Chicago and Mackinac island.

HUTCHINSON DAMAGED ON PORT SIDE ALSO.

When the steamer John T. Hutchinson went on the rocks west of Eagle River last November, it was supposed that her injuries extended only to the starboard side of her bottom. Indeed the original survey showed her starboard side to be in bad condition, but revealed no perceptible injury to the port side. It has now been discovered that she was really seriously damaged on the port side as well. Since repairs began upon her in the dry dock at Buffalo, nineteen plates and a number of frames have had to be removed from the port side. The more that is learned concerning the injuries of this steamer, the greater grows the wonder that she could have navigated nearly 1,000 miles of unlighted and ice-filled channels in safety.

foot of the lake remains solid. River St. Clair is open to Recors Landing; Detroit river is open to Lake Erie, and there is no ice visible from Amherstburg in Lake Erie. In Lake Erie the ice fields remain as extensive as reported last week and extend from the islands eastward to Buffalo. In Ontario the ice fields have moved with the wind and extend from one end of the lake to the other; over the extreme eastern end the ice field is breaking up. In comparison with the same period last season, there is more ice reported in all the lakes and no immediate prospects of an early breaking up of these conditions.

The Reid Wrecking Co. has purchased the steam barge Manistique and tug Salvor from the Edward Hall estate of Detroit. Large repairs will be made on them, and they will be used in towing logs for the Reids. The company has 90,000,000 ft. to deliver at Sarnia this season.

RETROSPECTIVE VIEW OF 1903.

The Shipping World of London is one of the most entertaining of marine publications and the Shipping World Year Book, issued by that publication and edited by Major Jones, is a most comprehensive port directory of the world. In addition to all conceivable information concerning shipping it contains the tariff schedules of all nations—in itself a voluminous work. The edition is enlivened by an introduction in the shape of a retrospective view of 1903 written by Major Jones. It is well-condensed and sensible and mentions in brief form everything worthy of comment that occurred in 1903. The introduction follows:

"The depression to which we referred when reviewing the position a year ago has pressed still harder upon ship building and shipping during the year 1903. Although the volume of oversea trade was the greatest in the history of commerce, freights have never been so low as during the last twelve months, and this remark applies practically to all shipping trades, in home and foreign seas and countries, with exceptions in the passenger and emigrant business. It goes without saying that this state of things has deterred many ship owners from ordering new tonnage. The best informed have bided, and are still biding, their time, until the bottom price is touched. Moreover, prices of ship building materials have been well maintained throughout the year; nor have the wages and earnings of artisans and laborers been much reduced; while British yards on the whole have been employed beyond expectations, beyond parallel or comparison (war vessels excluded) with the yards of any other country, and have turned out tonnage at lower prices than have ever before been booked for a similar class of ships. The world's output of war and merchant tonnage during 1903 aggregated 2,730,205 tons, and the contribution of British yards to the whole is 1,424,888 tons. The figures for 1902 gave a total output by the yards of the world of 2,733,024 tons; the contribution of the yards of the United Kingdom, 1,654,644 tons, leaving 1,078,380 tons as the output of the other ship building countries of the world.

"It is true that the British yards show a decline in output equal to 13.3 per cent.; while foreign and colonial yards have an increase of 20 per cent.; the world's production of shipping showing the small falling off of 0.09 per cent. But it must be explained that the more favorable position of foreign yards is accounted for by their largely increased output of fighting tonnage, and the falling off in the royal dock-yards figures from 51,560 tons in 1902 to 28,290 tons in 1903.

FEATURES OF THE YEAR.

"Among the notable facts of the year 1903 is the low price at which large cargo boats have been built, viz., from £5 10s to £6 per ton, and this, moreover, while the prices of materials and the earnings of the men remained at the level of 1902, at least until about the last quarter of 1903. Nor can it be said that the dividends of British ship building companies were unsatisfactory; they were certainly far better than those of Germany, France, and the United States, where the industry has experienced sorry times in many ways. Towards the close of the year under review, Messrs. Harland & Wolff launched for the White Star Line the largest ship ever put into the water, the Baltic, measuring 24,000 tons, and about 3,000 tons more than her predecessor built by the same firm, the Cedric. The Eastern Ship Building Co. of New London launched two great ships last year, the Minnesota and Dakota, each measuring 21,000 tons; while Germany's notable contribution to the world's merchant navy was the Kaiser Wilhelm II., measuring 19,360 tons and engined with quadruples indicating 40,000 H. P. Specializing still goes on, in several directions. The naval architect designs ships for the various trades—for the wealthy, the second, and emigrant classes of passengers, and for the cattle, dead meat, fruit, and other trades, whereby the ordinary car-

rier would be disadvantaged in a particular trade; while certain firms of builders lay themselves out correspondingly for special types of vessels. There is an element of danger in specializing; it may be carried too far, and at the expense of excellence of a general character. It is of the nature of that possible danger in standardizing referred to by Sir William White,—the "unwise advocacy and undue extension of such a method."

TURBINED STEAMERS; THE CUNARDERS.

"Ship owners have been carefully examining the claims presented by the advocates of the turbo-motor on the score of space, weight, and time saved; economies in lubrication, repairs, supervision, and other directions, and they are becoming satisfied, not "in battalions," perhaps, that the turbine is a rational business proposition. Having proved successful on the Clyde, turbinized steamers have been put upon the cross-Channel service.

"The Queen ran her practical trial trip between Dover and Calais in June last, and has since proved herself the fastest boat in the S. E. & C. service. She was built by Messrs. Denny of Dumbarton, and engined by the Parsons Marine Steam Turbine Co., is 310 ft. long by 40 ft. beam, and is registered to carry 1,250 passengers.

The publication of the ratified contract between the government and the Cunard company caused more stir in the world of ships than any other event of the year 1903. The company, in return for building and running two vessels of 25 knots speed, and keeping their entire fleet subject to government order, are, as we stated last year, to receive a yearly subsidy of £150,000, besides the loan of the money for building these two new ships, at 2¾ per cent. per annum. The attainment of the ½ knot more than any previous record, for large liners, is a great undertaking; and consequently a commission, including several prominent ship builders and owners, has been formed to consider the best methods of engining these vessels. The commission has not yet reported, but experiments are being made, and it is generally conceded that the 25-knot ships will require from 76,000 to 80,000 I. H. P. to drive them; that is to say, more than twice the power necessary on the Deutschland to attain 23½ knots. No machinery of such huge dimensions as this has ever been attempted; and the difficulties of the transmission of such an enormous amount of power and other considerations led to the suggestion that the new steamers should be engined with turbine machinery; and there is a general belief that the deliberations of the commission will end in the recommendation that this form of machinery be adopted. The Allan Line are convinced that the introduction of turbines will be to their advantage, and have ordered two 17-knot vessels of 12,000 tons register and 11,000 I. H. P., which are to be engined with Parsons' turbines. An order, among others, has been received by Messrs. Parsons for the machinery for a passenger vessel to ply on the great lakes of America, to accommodate between 1,500 and 2,000 passengers.

THE STANDARDS COMMITTEE.

"The Engineering Standards committee, described in these pages last year, continued its services during 1903. The direction of work has been towards the extension of the rules laid down by Lloyd's register. By following the recommendations of the committee, the work for the marine draughtsmen will be in future greatly lightened, for he will know that by using the standard sections advised, he will be able, among other advantages, to obtain, at the shortest notice and lowest price, the necessary angles and bars. The government has made a grant of £3,000 towards the expenses; and the India office, seeing the advantage which must accrue from the inquiry and report, especially in respect of locomotives for the state railways, has also made a grant to the committee of £1,000. The admiralty, who are among the largest users of rolled sections, have signified their approval in a most

practical manner, and have taken steps to give all orders for rolled materials in accordance with the findings of the Engineering Standards committee. This is but one of the many instances which go to show the enterprise and capacity with which Lord Selborne's great department is administered.

ENGINES AND BOILERS.

"No remarkable departures have been made during the past year in marine engine or boiler designs. The craze for extreme lightness seems to have worn out, and marine machinery, except for special purposes, is now built in a substantial way. On investigating the trial trips of modern steamers it will be noticed that fewer preliminary trials are now necessary, a fact no doubt attributable to the improvements in engine design. We seldom hear of hot bearings nowadays, and leaking boilers are comparatively rare, and this in spite of the high pressure employed in modern steamers, both cargo and passenger. Pressures of 210 and 225 lbs. per square inch are not uncommon, and the Central Marine Engine Works of Hartlepool have had considerable experience with steam pressures up to 267 lbs. This firm also use superheaters to a great extent, so that with high pressure and superheaters the temperatures reached in the cylinder must be very great.

"The return-tube boiler will probably soon become a thing of the past in certain branches of marine work, where it will be superseded by the water-tube boiler in one form or another. In the navy the latter has secured a firm hold; but it is yet undecided which of the many types is best suited for war vessels. At the present time there are being built, or already afloat, vessels for the royal navy fitted with all the more celebrated styles of water-tube boiler. In the mercantile marine of the United Kingdom this type has not met with favor; but since it has been decided to set the boilers, in the big Chelsea power station, on two stories to economize space, we may soon hear of steamers with boilers two deep. It is the amount of floor space occupied by a water-tube boiler which has to a great extent kept it out of the merchant service. Although up to the present internal combustion motors have not been used to any great extent, they give promise of very general employment in the near future for propelling smaller craft. It will be remembered that the late Sir Frederick Bramwell predicted the entire supersession of the steam engine by the internal combustion engine; and now several railways are experimenting on a large scale with oil engines for driving single coaches. These motors are of as much as 100 B. H. P. Some petrol engines of considerable size have been fitted in private launches during the last few months, and speeds previously thought phenomenal for such craft have been attained. That naval engineers are alive to the possibilities of this type of machinery is apparent by the fact that both the French and Russian naval authorities have ordered torpedo boats which are to be propelled by oil engines. Several of the different submarine and submersible boats are fitted with oil motors either as auxiliaries or as the sole propelling machinery; and generally speaking the internal combustion engine may be said to have entered on a campaign against the steam engine, in which it stands every chance to succeed.

DEPTH OF WATER FOR CHANNELS AND DOCKS.

"Depth of water in our British channels and rivers is a question of national concern. But it is receiving no attention from the government. The Americans are improving their water communications, and providing a depth of 40 ft. of water for shipping at their ports; the State and National governments are helping in this work of getting ready for the big deep draught ship of tomorrow. We are fond of imitating our kin over the sea; it is a habit with us; but we do so, not in internal improvements, not by helping private enterprise on the Clyde, the Tyne, the Mersey, the Thames, and other waterways to blast obstructive rocks, and give to

our great and growing ports deeper entrance channels and fairways to docks and berths, but by importing the customs and policies which do them the least credit. Much, however, is being done by river trustees, commissioners and other organizations without a shilling or a smile from government. But we say unhesitatingly that deeper channels must be provided by those authorities which control river improvements. Surely the very recent lessons of the Mersey and the Clyde (to mention but two, where all our port authorities might be called up) should inspire them to look ahead and copy America—by providing depth of water, 40 ft. by all means, and by securing national aid for improvements that must be of great advantage to the nation. Help and encouragement; these are strengthening, lasting tonics; bounties and sops are demoralizing, and bad for giver and receiver, for the protected and for the whole people.

TARIFF CHANGES AND PROPOSALS.

"For over a year importers and exporters have been kept in a state of uncertainty and anxiety in respect of the new German tariff which passed the Reichstag in December, 1902, but still awaits the proclamation of the emperor, without which it remains inoperative. It will be remembered that the schedules prepared by the government were cancelled by the Agrarian majority, and others, providing higher import duties substituted for them. This has made it difficult, apparently impossible, for Count Von Buelow to negotiate fresh commercial treaties with other countries. Experience teaches us that while a government may propose what it considers a 'scientific' tariff, a mustering of interested members of parliament may compel that government to set it aside for something which they believe would better serve them. Tariffs have also been formulated by Austria and by Russia, but the former has not yet been passed by the Reichsrath, while the latter is also hung up by the Russian Council. The formation of these tariffs has been largely influenced by the new German tariff passed, as we have stated, in December, 1902, and would probably still be modified, especially in respect of minimum duties available for treaty making, if it were possible to modify the German tariff also. This, however, can scarcely be done constitutionally, and the position can only be accommodated by utilizing the old German tariff still in force for treaty-making purposes. The tariff of the South African colonies has been simplified by the formation of a Customs Union (similar for this purpose to that of the United States), which provides one set of tariff schedules for all the colonies. Many changes have been rendered necessary by the Brussels Sugar convention, and the consequent legislation. A reciprocity treaty of a preferential character has been ratified by the United States and Cuba. Whether its terms will enable other nations to claim 'most favored nation clause' treatment is not at present quite clear. There have been changes of varying degrees of importance in the tariffs of Japan and France, and, indeed, of nearly all commercial nations during 1903."

The Review last week contained a brief sketch of Mr. Charles H. Haswell, the dean of marine engineers in the United States. It is interesting to note that he has lived to see his *Mechanics' and Engineers' Pocket Book* go into its seventieth edition and that he makes periodical trips to his publishers for royalties upon it. Though he is ninety-six years old he dresses carefully and usually wears a carnation. Mr. Haswell's recipe for longevity is to be moderate in all things and to eschew the use of tobacco. He gave up smoking at the age of ninety-one "as a matter of principle." He adds that it was a hard struggle to do so.

The triple-screw cruiser *Columbia* struck on a pinnacle rock in the harbor of Bacolis lately. She was not seriously damaged.

AROUND THE GREAT LAKES.

A new revised chart in colors of Buffalo harbor and Niagara river to the falls, has just been issued by the United States lake survey and is for sale by the Marine Review.

The package freight steamer Buell, owned by Weston & Dulac, is being cut down into a lumber carrier by Danford & Alonson Dry Dock Co. She will go into the Manistique and Tonawanda trade.

The south abutment for the new Jack Knife bridge over the Blackwell canal at the foot of Michigan street, Buffalo, is finished and in a short time the iron work of the bridge proper will be put together.

The state tug John M. Partridge was the first vessel to get steam up in the Tonawandas this season. She broke the ice in the Erie canal from Tonawanda to Buffalo and towed the state mud dredge to Buffalo for repairs.

The steamers of the Toledo division of the White Star Line will use the American channel of the Detroit river this season, provided it is properly marked. This is an entering wedge for the diversion of traffic from the Canadian channel.

Navigation between Cleveland and Detroit was opened last year on March 18. Mr. D. C. McIntyre, the general freight traffic manager, has just sent out a postal card that the season of navigation this year will commence on Tuesday, April 5. Weather conditions have prevented an earlier opening.

Among the vessels to be repaired at Duluth are the James H. Reed, S. S. Curry, Robert Bunson, John Fritz, barge 137, Colalia, Howard Shaw, Frank H. Peavey, Isaac Ellwood, James J. Hill, Fred B. Wells, William R. Linn, James Colgate, Briton, Magna, Harvard, Sir William Fairbairn, Robert Wallace, James H. Hoyt, John Sharples, Douglas Houghton, Roman.

Mr. G. L. Douglas, Jr., has been appointed manager of the Lake Transit Co. for the coming year with headquarters at Duluth. The Lake Transit Co. owns the steamers Scranton, Russia and Lackawanna. For the past five or six years the vessels have been operated on the lakes by the Lackawanna-Green Bay Line, carrying package freight between Green bay and Buffalo. This lease has been terminated.

The collier which the Buffalo Drydock Co. built for the Pere Marquette people will be taken up the lakes just as soon as the ice breaks up. It was intended to take her up last fall, but weather conditions were against it. She has been finished for some time. She is an experimental proposition and it is understood that if she proves to be successful orders for several other boats like her will be placed.

The board of trade of St. Catharines, Ont., has begun a movement for the taking over of the Welland railway by the Dominion government. The railway is 27 miles in length, paralleling the Welland canal from Port Dalhousie to Port Colbourne, and is chiefly used for the trans-shipment of grain, vessels coming down the lakes heavily loaded being required to lighter in order to reduce their draught to the capacity of the canal.

A Duluth dispatch says that J. McLeod of Buffalo, of the Laidlow Lumber Co., has just concluded a deal for the purchase of 10,000,000 ft. of high grade lumber from the Edward Hines Co. The deal involves about \$250,000. The entire lot will be delivered by boat to Buffalo during the coming season, a part of the sale being forwarded from the Marinette yards. The deal is one of the largest in high grade stock that has been made in some time.

The Indiana Transportation Co. is quite determined that the prettiest girl in Indiana shall name their new steamer Indianapolis, building at the yard of the Craig Ship Building Co., Toledo. There were so many applicants for the place that it was determined to leave it to a vote. Over 200,000 votes have been received so far. Miss Eula Clay of Indianapolis and Miss Rena Harris of Muncie are the leaders. The launch will probably occur in May.

Mr. Silas Hitchcock, who resigned as a member of the firm of M. A. Hanna & Co. on Jan. 1, severed his connection with the active business of the firm this week. During the past three months he has been straightening up the affairs of the office. Mr. Andrews, who had charge of the dock department of the firm for a number of years, will succeed Mr. Hitchcock. General regret is expressed in all branches of lake trade that Mr. Hitchcock has left the business.

The Great Lakes Engineering Works of Detroit has filed a trust mortgage to the Union Trust Co. as trustee to secure a bond issue of \$500,000. The issue consists of 500 5-per cent gold bonds of the denomination of \$1,000 each. The bonds are to provide working capital. The company has begun the construction of its big floating dry dock, which is to be used in conjunction with its ship yard. It is expected that the steel steamer R. W. England, now building at the yard, will be launched some time in April.

The Anchor Line has announced the following appointments of masters for the coming season: India, Capt. A. McKenzie; China, Capt. H. Cronkhite; Japan, Capt. John Doherty; Tionesta, Capt. Charles Christy; Muncy, Capt. D. Ryder; Codorus, Capt. H. O. Miller; Mahoning, Capt. Joseph Corcoran; Schuylkill, Capt. Charles Nelson; Susquehanna, Capt. L. Wright; Clarion, Capt. George J. Delaney; Lehigh, Capt. Edward Martin; Alaska, Capt. F. Bloom; Lycoming, Capt. M. Boggan; Conemaugh, Capt. J. J. Lehan.

It is expected that car ferry No. 19, which stranded off Fox Point, will be in dock at Milwaukee for fully a month longer. The work of replacing the damaged plates is being pushed forward rapidly. Both dry docks at Milwaukee are crowded with work so that the new wheels which are to be placed upon the Grand Haven will be placed on her where she is moored in the river. Her forward compartments were filled with water and by running loaded cars forward her stern will be high enough out of the water to enable workmen to fit the necessary buckets.

The United States circuit court of appeals has just handed down a mandate in the case of the American Steel Barge Co. vs. the steamer Philip Minch, No. 2163 in admiralty, confirming the decree of the United States district court, as entered by Judge Ricks June 10, 1899. This was one of the last cases heard by Judge Ricks, in which he rendered a decree for the libelants, finding the Minch solely at fault in bringing about the collision and the damages as set forth in the libel, and rendered judgment for damages and costs against the Minch and the stipulators on the bond.

The work of fitting out the tugs of the Great Lakes Towing Co. at Buffalo is well under way, and it is expected that all the tugs will be in readiness for the season's work by April 1. Many of the vessels are receiving extensive repairs. The W. G. Mason, the largest of the fleet, left the dry dock last week after having a new wheel put on. She broke her propeller several days ago while crushing ice in the Blackwell canal. Capt. Lautenschlager, the new manager, will have a powerful fleet of tugs at his command this season, among them being the Mason, Babcock, Conneaut, Delta, Gee and Danforth.

Mr. H. L. Jester, the agent of the Seamen's Union at Detroit, says that the Marine Cooks and Stewards' union will wage war upon women cooks this year, as they did last year. He maintains that ship board is no place for a woman and gives as one of his reasons that they will always throw the galley refuge to windward with the inevitable result of making a scrubbing job for the men. He also adds that they are no good in a sea and take to their beds in foul weather. Nevertheless, the action of the union in excluding women from the barges worked a considerable hardship last year in a number of individual cases.

Major Theodore A. Bingham, United States government engineer at Buffalo, was seriously injured by the falling of a

derrick on the south pier of Buffalo harbor last week. An examination showed that his left leg had been broken below the knee. The accident happened during the hoisting of a naphtha launch from the river to the dock in front of the government store house. The launch was lifted almost to the top of the pier when some of the spectators noticed that the timber upon which the derrick rested was sliding. An alarm was sounded but not quite quick enough, the top of the derrick executing a long sweep and bowling over the men like so many ten pins. Major Bingham was the only one seriously injured. It is gratifying to learn, however, that he is steadily recovering.

The United States court of appeals at Cincinnati has handed down an opinion in the historic Trevor-Crescent city collision case in St. Clair river, holding the latter solely at fault and reversing the degree entered by Judge Swan of the Detroit district. The damages claimed are \$19,282.36 and the higher court orders that this sum be paid with interest. The Crescent City is also held for the costs. There were five steel boats in the accident, which occurred on the night of Aug. 9, 1899, and it was perhaps one of the worst mix ups that ever happened on the great lakes. The wonder was that more extensive damage was not inflicted on the crafts that were in it. The boats involved in the collision were the steamers Trevor, Maricopa and whaleback barges Nos. 118 and 131 and the barge Manila. The Trevor was struck by barge 131 and in order to prevent the steamer from sinking she was run ashore on the Canadian side, where she settled on the bottom. The collision was caused by the Crescent City steaming at full speed between the Trevor's tow and that of the Maricopa.

CANADIAN SHIPPING NOTES.

A. Wallace, Vancouver, B. C., proposes to start construction shortly on a 1,200-ft. marine slip there.

The Eastern Steamship Co. of Portland, Me., has registered in New Brunswick as an extra-provincial company.

A company is being organized at St. George, N. B., to purchase a steamer to run on a route between that port and St. John.

The stern wheel steamer Hamlin was sold at Vancouver, B. C., recently for \$2,200 to H. A. Jones, to satisfy claims for wages, etc., amounting to \$1,400.

The Digby (N. S.) board of trade is interested in the formation of a company to construct a marine slip, capable of accommodating vessels of 1,000 tons, at that port.

The tug John Harrison is being re-engined at Owen Sound, Ont., by Sinclair & Doty. A compound engine (cylinders 19 in. and 32 in. by 26 in. stroke) is being installed.

The department of marine has appointed a pilotage commission for the Saguenay river district, Que. Hitherto the river has been under the jurisdiction of the St. Lawrence pilots.

The St. John, N. B., city council has let a contract to Jas. Fleming, of St. John, for the construction of a ferry steamer at a cost of \$80,000. The hull will probably be built at Portland, Me.

The steamer Lincoln, which has had a rather chequered career on Lakes Ontario, Erie and Huron, sank at her dock at Windsor, Ont., Mar. 9, and she lies in 40 ft. of water, but will be raised.

A branch of the Canadian Association of Masters and Mates has been organized at Owen Sound, Ont., with Capt. F. X. La France as master; A. McNab, treasurer, and P. McNab, secretary.

F. S. Blair and Capt. Dougal of Campbellton, N. B., have been given a contract by the Dominion government for a steamship route on Gaspé Bay, Que., and are looking for a suitable steamer.

The trustees of the Collingwood (Ont.) marine hospital are applying to the Dominion parliament for power to mort-

gage certain of its property for the purpose of enlarging and improving its buildings.

The Butler Freighting & Towing Co. has been incorporated under the British Columbia companies act, with a capital of \$25,000, and head offices in Victoria, B. C., to carry on a general navigation, towing and lighterage business.

The Huntsville, Lake of Bays & Lake Simcoe Navigation Co. will build a new steamer this season for its Lake of Bays route. Capt. G. F. Marsh and W. Duperow, of Huntsville, Ont., are marine superintendent and manager respectively.

The Hamilton Steamboat Co., the Niagara St. Catharines and Toronto Navigation Co., and the Toronto Ferry Co. have granted an increase of \$5 a month to the firemen on their steamers for the season, the rate of pay will be \$40 a month.

The steamer Chieftain, owned by Mr. Cunningham, Port Essington, B. C., is having new upper works built, and is being given a general overhauling at Vancouver. The Chieftain is 87 ft. over all, with light draught, and trades generally along the coast.

The Fredericton & Woodstock Steamship Co. has decided to dispense with a manager this season, and has reappointed Capt. Norwood to the Aberdeen. The Aberdeen is being overhauled at St. John, prior to taking up her route on the St. John river.

The Montreal harbor commission will receive tenders for the construction of fourteen steel sheds on the wharves, four to be completed within six months, five more to be completed by May 1, 1905, and the remainder by May 1, 1906. The total cost of the work is estimated at nearly \$3,000,000.

A report from Gaspé Basin, Que., states that Capt. Dugal has purchased a steamer in New York for the Dalhousie, N. B., Gaspé, Que., run and the new steamer is stated to be 175 ft. in length; 26 ft. beam, with a speed of 14 knots an hour, and a capacity of 50 passengers and 300 tons of cargo.

An order of committal for contempt of court has been issued against Capt. Thomas Donnelly of Kingston, Ont., for neglecting to file an account of certain transactions in which he was engaged as an officer of the Donnelly Wrecking Co. The proceedings have been before the courts for over a year.

The great lakes shipping interests in Canada propose to ask the government to further improve the locks at the entrance to the Lachine canal at Montreal; to lengthen the entrance lock at Morrisburg, Ont., from 280 ft. to 800 ft.; to deepen the Welland canal, and to complete the Trend Valley canal from Lake Ontario to Georgian Bay.

OBITUARY.

Capt. J. W. Pierce, steamboat and yacht designer, and at one time associated with the Chaffey Ship Building Co. of Portsmouth, Ont., died there March 13, aged 73.

James Fitzgerald, veteran marine engineer, died at St. Mary's hospital, Duluth, last week. He had practically made his home at the hospital for the past fifteen years, owing to ill health.

Mr. Charles Counselman of the firms of Counselman & Co. and of Charles Counselman & Co. of Chicago, died at Virginia Hot Springs last week. He was one of the most progressive business men of Chicago, operating on the board of trade and conducting one of the largest elevator enterprises in the country. His widow and two children, Edith and Charles Counselman, survive him.

Jesse Spalding, one of the pioneer lumbermen of the northwest and a resident of Chicago for nearly forty-five years, died last week. He had been in ill-health for over two years. Mr. Spalding was for many years the dominating spirit in both the Menominee River and Spalding Lumber Co. He also gained the possession of valuable mining lands in upper Michigan. He was instrumental in the construction of the Sturgeon Bay canal between upper Michigan and Green Bay, and was in every way a progressive citizen.

SEEN AND HEARD ON THE LOOKOUT.

At a time when reports of naval engagements are momentarily to be expected something anent a visit on board a foreign war vessel that recently visited these shores may be deemed opportune. Modern men of war are not suggestive of the rope handling tar, the latter an individual who, according to the old songs of the sea, did deeds of valor among an indescribable confusion of rigging if not more pleasurably engaged in drinking rum and dancing jigs. A visit to an up-to-date war vessel gives the impression of a floating machine shop, strongly fortified, and where the employes are compelled, not only to be neatly uniformed, but to conspicuously display the insignia of the various branches of the trade in which they are respectively trained. And now a description of a day's routine on the foreign armor clad that not long ago visited America.

At 5 a. m. a drummer and a piper gave indications of an ambition to disprove the truth of the saying that music has charms to soothe the savage breast. While the music rendered at this unearthly hour could be called neither soothing nor charming it effectually roused a ship's crew—400 strong—sleeping in hammocks that were slung in every nook and cranny of the spacious 'tween decks. Four minutes were allowed to lash hammocks, each hammock to have five turns of the rope, and to be of the regulation size as to length and width with a view to economize on the available space for their bestowal. As soon as all traces that naval sailors court the embraces of morpheus had been obliterated the crew makes its toilet "en masse." With the utmost of good "camaraderie"—whatever others may call it—several men made use of the same bucket and the same water for washing purposes. Long boards, immaculately white and swinging by iron rods from the deck, are the tables that suddenly transformed a sleeping apartment into a gigantic banquet hall. Breakfast consisting of oatmeal, coffee, bread and butter was served at 5:30. The occupants of each table had one of their number act as waiter, and the latter had to wash the crockery at the conclusion of the meal while the rest of the crew ranged themselves on the upper deck in groups according to their mess. The head of each mess then counted the number of his table mates and reported to some superior, who in turn gave the information to another still more important, and so on until finally the officer of the deck was made aware of the fact that not a single member of his crew had been lost or stolen during the night. Though the ship looked exceptionally clean everything had now to be washed, scrubbed or polished. And to give all something to do hand pumps manipulated by marines soon brought up torrents of water which the sailors promptly swept to the scuppers. Everything being clean before the commencement of this operation, one can only say that when according to the boatswain a sufficient amount of water had been distributed a shrill whistle gave notice to this effect, and deck drying, brass polishing and gun drill was the next order. In the meantime in the 'tween decks the tables had vanished as suddenly as the hammocks, and the place now had the appearance of a provision market. Huge pieces of meat were placed on a large square of canvas. A sailor states the number of men in his mess and receives a chunk of meat weighing the required amount to give each of his messmates the prescribed quantity. A steel pin, upon which the number of the mess is stamped is passed through the meat and securely tied with a piece of manila rope. The cook then receives these pieces of meat, and after boiling the needed length of time the marked steel pins enable each messman to quickly identify his particular portion. Dinner at 11:30. Pea soup, meat, potatoes and bread. After dinner there is a lull in the general activity until 2 p. m., when fresh water is carried from the storage tanks to the different places

along the decks where a supply is kept for the daily use of the crew.

It is at this time also that the cook receives his daily allowance of water. At 5 p. m. the 'tween decks again becomes a dining room, to be transformed into a sleeping apartment three hours later. At 8:30 a similar selection of music as that which roused the crew in the morning gives notice that lights must be put out and conversation suspended. A marine on the bridge, a sailor on watch forward, another sentry at the 'tween decks hatch—and all is well.

An English ship owner once stated that his ships' deck officers generally hailed from the north east coast, the sailors from Sweden, the firemen from Ireland and the engineers from Scotland. This ship owner's views as regards the nationality of his engineers coincide with those of a humorous individual who gave it as his opinion that anyone calling down the engine room skylight of English steamers: "*Are you there, Mac?*"—will in nine cases out of ten be answered in the affirmative. And what more natural than that, engineers should be numerous in a country where the greatest number of marine engines are built. A trade journal once estimated that for a period of three years one steamer per week was launched from the yards of a comparatively small Scottish seaport.

Many of these steamers were not intended to fly the English flag, but were built to the order of shipping firms in countries where the price of labor is immeasurably cheaper than along the Clyde. Incidentally it may be said that this latter fact clearly demonstrates that the cost of manufacture of a steamship does not depend wholly on the cheapness of the labor used in its production. England competes successfully with European yards where the remuneration of a workman is only termed "pay" by courtesy. Once during a visit to England I spent some time in a well known cradle of tramp steamers' engines. In the so-called "erecting shop" engines in various stages of advancement were standing in rows. Directly behind each of these engines a huge number was painted on the wall, and this number was stamped on even the most minute of the engine's component parts. In the "fitting shop" specialization had been reduced to a science. One workman, for instance, had done nothing for five years but adjust eccentrics and their straps, while another had for nine years given his undivided attention to the important item of crank pin brasses. The men here alluded to received thirty shillings per week of fifty-four hours, and considered themselves fairly well paid. And from the standpoint of employers of labor on the continent of Europe they were munificently rewarded. When an engine is completed a large traveling crane transports it to the ship's hold, its permanent place of residence for better or worse, and upon the occasion of my visit it happened to be a French steamer. At least, she would be French directly after the owners agreed to accept her from the builders. During her trial trip, besides the inactive French crew, a force of experts in the employ of the ship building firm agreed to hasten the ship's process of what "Kipling" termed "finding herself." In the engine room four French engineers stood in a row against the bulkhead in silent contemplation of numerous grimy individuals whose chief object in life appeared to be the pouring of oil in all directions. But the ship building firm supplies the oil for the trial trip, and the bilge pumps presently forced most of it overboard. And if oil was cheap there seemed to be a premium on the waste of coal. On this occasion everyone was satisfied. The trial trip proved a success. The French captain complimented the Englishman who had thus far been in charge on the bridge, the Scotchman at the reversing gear below the water line abdicated in favor of a gentleman from

Havre, the English colors were stowed in a pigeon hole in the pilot house to give the French flag an airing, a tug took off the trial trip crew, and amidst much shouting the two crafts proceeded in opposite directions. Bon voyage.

Occasionally even those only remotely interested in shipping are made aware of the fact that the Atlantic Coast Seamen's Union is still strong, progressive and keenly alive to the needs of its members. In this union, however, there appears to exist a "Coterie" known as the "strong arm gang," whose methods of intimidating fellow craftsmen guilty of the crime of non-unionism were objected to by the ship owners along the coast in general and those of New York in particular. Mr. Pendleson, one of the best known men in New York shipping circles, some months ago created the "shipping Federation," and confidently believed that he had discovered the union's Achilles tendon. The Shipping Federation's offices were located on the second floor of an old office building, and lured there by the promise that union wages would be paid without discriminating between union and non-union men, this place was daily thronged to the utmost of its capacity. The union officials clearly considered that it was "up to them" and they promptly rented an office on a lower floor. The rigors of Russian censorship pale into insignificance in comparison with the uncompromising blockade of the stairway leading to the Shipping Federation's headquarters. As might have been expected of such a splendid tactician Mr. Pendleton, finding his case untenable and hardly strategic, retired his forces in good order to a locality less exposed to the fire of the enemy. The Seamen's Union, regarding the withdrawal of the opposing faction as a sign of victory for themselves, next decided to follow up the advantage gained.

At present only seamen employed on coastwise sailing craft have enrolled as members of the union, and it now appeared an opportune time to organize the steamboat men. Circulars addressed to the steamship sailors of the Atlantic coast, pathetically describing the mariners' hard lot and learnedly discussing human nature, have been distributed along the water-front, and everywhere groups of seamen could be observed reading something like this: "Seamen are getting \$35 on sailing vessels. Why are you working all day and part of the night for \$25? Other seamen are getting better wages—on the Lakes. Do you remember when deck hands on the Lakes were paid \$15 per month? Their pay is \$30 now. Why do you work for only \$25? Do not blame the ship owner. Do you pay more than the dealer asks you for the coat you buy to use on the lookout? There is a union branch in every port on this coast. We are waiting for you; join us now and you will get \$10 a month more than you are getting at present. The owners are only human; they pay the market price, and if they can make the price they'll do it. In the meantime, at the Shipping Federation's offices the young superintendent, Mr. Toby Von Syberg Peterson, a reputed descendant of a Swedish king, positively declares his belief in the longevity of his organization.

F. H.

LABOR IS THE CHIEF SUFFERER.

Editor Marine Review: Inclosed please find text of letter sent by me to every senator and representative in Congress, covering legislation there pending in which all of our members are personally interested. We ask that you will, in discussing these measures, present the side of labor, as viewed by labor. We also ask you to note that if American shipping does not present to capital as safe and profitable an investment as foreign shipping presents, capital will go into foreign and will be withheld from American shipping. Capital does not suffer loss of employment in such a case, but American labor does, hence our appeal for legislation that will build up an American mercantile marine. Foreign ships enjoy every

privilege in our foreign trade under our laws that American vessels enjoy. Members of congress and others may think that by denying protection to our shipping equivalent to that given to our land industries that are brought into competition with foreign industries, an assault upon the treasury is prevented. But the result is protection for foreign shipping at the expense of American labor. The consequences are injurious to the nation, as well, because the country lacks the element of strength and protection—really essential to the national defense—as a result of by negation protecting and building up foreign shipping and permitting the utter effacement of American shipping, officers and seamen.

Your careful and just consideration of these points, and their presentation to the American public, will greatly oblige an organization of men three-fourths of whom are now out of work because of the present desperate condition of stagnation in American ship yards.

Very respectfully,

JOHN MCNEIL.

President-Organizer Brotherhood of Boiler Makers and Iron Ship Builders of America.,

The text of the letter sent by President McNeil to members of congress follows:

"In the name of 24,000 American workingmen, members of the Brotherhood of Boilermakers and Iron Ship Builders of America, with 500 lodges in as many different parts of the United States, I most respectfully ask you to support the following bills now pending in Congress, on the sole ground that their passage will mean more work for our members at their trade:

"Senate bill 2,259, 'To regulate shipping in the trade between the ports of the United States and ports or places in the Philippine Islands,' and house bill 12,222, which is the same thing; senate bill 2,263, for the carriage of government war and naval stores in American vessels, and house bill 16,139, which is the same thing; and house bill 7,056 'creating a commission to consider and recommend legislation for the development of the American merchant marine.'

"We are not interested in trusts, combinations or monopolies, we have neither political nor partisan interest in these bills; we want them passed because they mean work for us at our trade.

"American ship builders cannot build ships as cheaply in the United States as foreign ships are built, largely because the wages men of our craft receive, which are far higher than obtained in foreign ship yards and boiler shops. We stand for the American standard of wages and of living, and are better citizens because we enjoy them. We want no diminution in our wages and no reduction in our style of living; but we want to stand, as do workingmen in other trades, on the American level. They are able to do so, largely, because our government protects them against the free competition of foreign products. Our ships in the deep sea trade are unprotected, and so cannot compete with foreign ships. Congress should remedy this condition, and this we ask. The bills above named will help, wherefore we again appeal to you to work and vote for them, in the interest of American workingmen."

Admiral Dewey and Rear Admiral Taylor, who are members of the army and navy general war board, are opposed to the attempt that is being made to authorize the construction of submarine torpedo boats for use in the army in its coast defense system. They are not opposed to the submarine in itself, but maintain that it is a mistake to create a navy branch of the army. The work of marine harbor defense, they say, should be in the hands of the navy department. The army general staff, however, believes that it should be controlled by the army.

ITEMS OF GENERAL INTEREST.

The battleships Kearsarge, Alabama, Missouri and Massachusetts arrived at Pensacola on March 14 for target practice.

It is quite likely that the speed motor boat Vingt-et-Un may be given a speed trial shortly in Boston waters.

The net profits of the Nova Scotia Steel & Coal Co. for 1903 were \$859,397 compared with the previous year's earnings of \$609,935.

The battleship Kentucky, flagship of Rear Admiral Evans, arrived March 16 at Hong Kong, where she is to be docked preparatory to returning home.

The lightermen and stevedores employed in Havana harbor have threatened a strike if their demand for payment in American instead of Spanish money is refused.

Advices from Pernambuco state that the British brig Gladiola, Capt. Cave, from Pernambuco, has been wrecked and lost at Cape St. Roque. The captain and eight of the crew landed at Natal.

The steamer Samuel J. Pentz has been sent to the ship yard at Newport News to have a broken shaft replaced with a new one. Considerable boiler and engine work will be done on the steamer.

The annual meeting of the United States Steel Corporation will be held at Hoboken, N. J., on April 18. Eight directors are to be elected and several amendments to the by-laws will be acted upon.

The report of the Cambria Steel Co. for 1903 shows net earnings of \$3,048,755 as compared with \$5,084,260 for the previous year. The total surplus as of Dec. 31, 1903, is \$2,201,312, an increase for the year of \$718,991.

News has been received that the three-masted schooner Mabel Gray, owned by Dolbeer & Carson of San Francisco, with a cargo of lumber for Los Angeles, went ashore at Port Redondo. The crew was rescued and the vessel may be saved.

Wm. Nelson Cromwell, counsel for the Panama Canal Co., has sailed for Paris to effect the transfer of all the property of that company to the United States government. It is expected that the actual transfer will be arranged to take place on April 20.

The battleship Missouri collided with the battleship Illinois off Guantanamo recently, damaging the port propeller of the Illinois and inflicting slight injuries upon her. The cause of the accident was the sudden disablement of the steam steering gear of the Missouri.

The retirement of Rear Admiral O'Neil leaves Rear Admiral Rae as president of the board of construction by right of seniority. Within a little over a half year's time the entire personnel of the board has changed. The outlook is for harmony as at present constructed.

Secretary Moody has signed an order to equip eighteen battleships and armored cruisers with submerged torpedoes. The board of construction decided to omit torpedo tubes from all battleships, but the protests against the report were so great that the board was forced to reconsider its action.

The new ferry boat Arlington of the Erie railroad made her trial trip on March 16 between the Battery and Thirty-ninth street, Brooklyn, and between the Battery and Staten Island. These are the routes designated by the legislature for municipal ferries and the Staten Island route. The Arlington was built by the Burlee Dry Dock Co. of Staten Island from designs made by J. W. Millard, marine architect of New York.

A small steam vessel, resembling a torpedo boat but known as a vedette, or sentinel boat, purchased in England recently by the navy department, is being overhauled and repaired at the New York navy yard preparatory to a series of speed and turning trials. It is intended that, should the trials prove satisfactory, a number of them be built, to take the places of the steam launches now used on all the cruisers and battleships. When the series of trials is concluded the present vedette boat will take the place of the steam launch Undine, now used by the commandant of the station as a tender.

Sir Weetman D. Pearson, head of the firm of S. Pearson & Son of London, the successful bidder for the four tunnels under the East river of New York, to be built by the Pennsylvania Railroad Co., was given a dinner by a number of representative engineers and others last week. Among those who were present were Andrew Freedman, George W. Young, Valentine P. Beard, John F. O'Rourke, George Gibbs and Alfred Noble. The table was set in the form of a keystone, the trade mark of the Pennsylvania railroad.

Wyckoff Bros., Clinton, Conn., are building a gasoline launch for Capt. John J. Phelps, the well known yachtsman who has a summer home on the Thimble islands near New Haven. Her dimensions are 43 ft. over all, 41 ft. water line, 6 ft. beam with a draught of 6 in. She will be of torpedo-boat shape and built somewhat more substantial than craft of her class usually are. She will be equipped with a 6-cylinder Hasbrouck engine of the latest type with skeleton frames, and the builders have guaranteed a speed of 20 miles an hour.

The American Line steamship New York grounded while approaching the harbor of Cherbourg last week during a fog. The sea, however, was smooth and the tide floated her off without much injury within an hour. Later while on the voyage upon the channel a dense fog descended. When off Hurst Castle, England, the British troop ship Assaye suddenly appeared, and it was found impossible to avoid a collision. The New York crashed into the Assaye's starboard bow, tearing a great gash in that vessel. The New York's bowsprit and figurehead were carried away. The boats of the Assaye were lowered and the troops mustered, but the Assaye's collision bulkhead saved her. Both vessels put back to Southampton.

COMMENTS ON FITTING-OUT NUMBER.

Your issue was a very interesting and handsome one.

THOMAS FLEMING DAY,
Editor The Rudder.

New York, March 16.

It is a production of which you have every reason to be proud.

STEVENSON TAYLOR,
Consulting Engineer.

New York, March 16.

I certainly congratulate you on the changes made in the make-up of the paper, and in the apparent purpose of increasing the discussion of shipping rehabilitation.

WM. W. BATES.

Denver, March 14.

We wish to compliment you on the magazine. It is very comprehensive and reflects great credit.

Yours very truly,

HENDERSON WEIR,
Secretary Harlan & Hollingsworth Co.

Wilmington, Del., March 19.

I have received and examined the new and enlarged edition of the Marine Review, and most heartily congratulate you upon an interesting, well arranged and useful publication.

A. T. BOWLES,
President Fore River Ship & Engine Co.

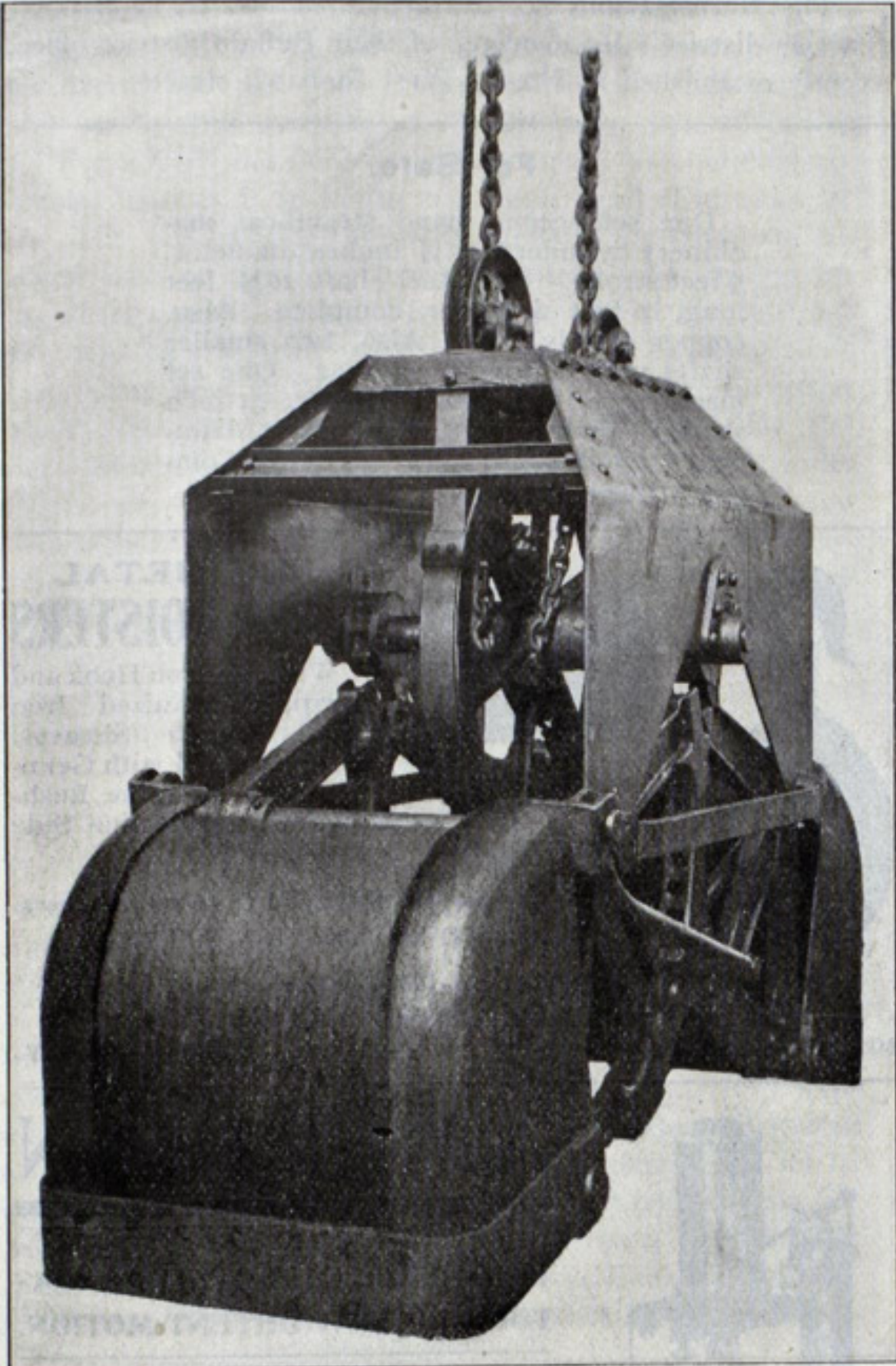
Quincy, Mass., March 17.

I was agreeably surprised, on the receipt of the Review under date of March 10, to notice the great improvement of your journal as evidenced in that issue. I extend hearty congratulations, and predict a great success to your efforts. You have well covered a large territory, and drawn interesting matter from many sources which I feel will be fully appreciated by your patrons, and will surely increase the number of your subscribers.

EDWARD SMITH,
President Great Lakes Towing Co.
Cleveland, March 16.

SWEDENBORG CLAM SHELL BUCKET.

A new type of clam shell bucket has made its appearance within the last year and has created great interest among dock and furnace men. This bucket is the "Swedenborg" and is manufactured by the Macbeth Iron Co. of Cleveland. There is nothing experimental about this bucket as it has been thoroughly tested on the ore unloading docks of Lake Erie. One



SWEDENBORG CLAM SHELL BUCKET OPEN.

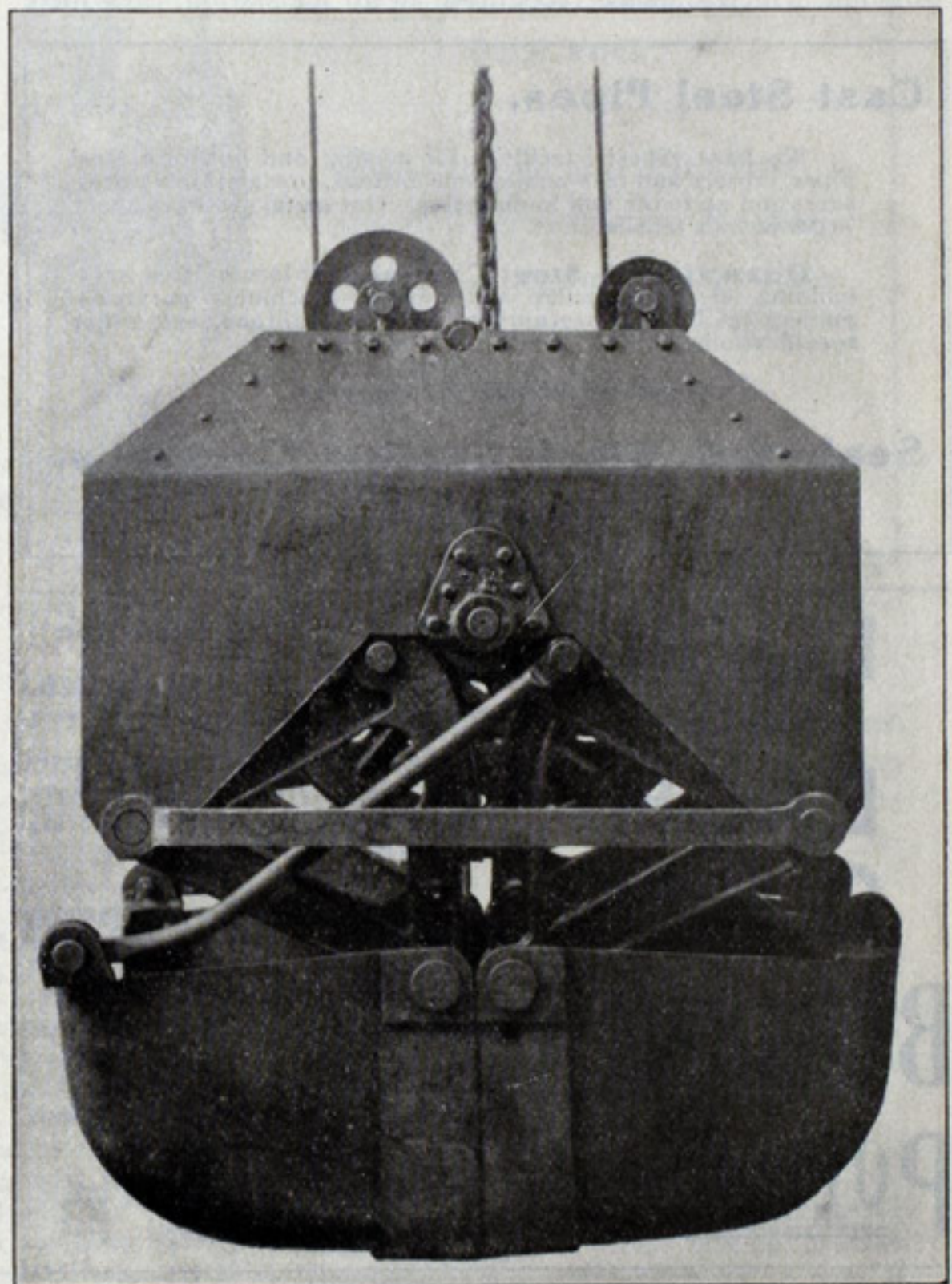
of the docks of the United States Steel Corporation at Fairport is equipped with them, and practically every boat which entered that harbor during the past season was unloaded by them with great economy and efficiency. It has also been used with equal success on the docks at Ashtabula harbor. The accompanying cuts show the bucket in both open and closed positions and gives a general idea of its design, construction and method of operation. The closing force is applied through a power wheel and pinion, meshing with steel geared segments which carry the front of the scoop. This mechanism in connection with the toggle effect of the links, gives an extremely powerful closing force. The back of the scoops are carried by links, each scoop being connected by them to the geared segment on the opposite side. This combination of driving from the front of the scoop and carrying the back from the opposite segment, gives the bucket one of its strongest features, a powerful and effective digging motion. The bucket is of very strong and rigid design and construction, everything being constructed of steel, no iron whatever being used.

At first sight the objection would possibly be raised that the ore or other material would get into the geared segments and thus cause them to bind. This has been fully guarded against by cutting away the bottom of the teeth entirely on one segment and making a "V" shaped bottom of tooth on

the other. Absolutely no trouble whatever has been experienced from this cause during the year or more these buckets have been in continual operation. This bucket is of relatively light weight, which is, of course, an important consideration when equipping existing rings with them. It has the remarkable facility of picking up 25 per cent more ore than its own weight.

The illustrations, one of them being used on the first page of the issue, show arrangement with power wheel with two closing lines, the lines being on longitudinal center line of the bucket, the second line being merely for the purpose of steadying the bucket. If the nature of the equipment demands it two power wheels are substituted, thus placing the closing lines the opposite way, or one line only may be used if other means are provided for steadying the bucket. The opening is accomplished by means of chain running around a small hub on power wheel shaft and the operation is just the reverse of the closing, with the exception that it is much quicker.

This bucket, although primarily intended for iron ore is equally well adapted for handling coal, sand and other coarse



SWEDENBORG CLAM SHELL BUCKET CLOSED.

material. It is also an efficient and economical means of excavating and dredging.

In addition to building these buckets, the Macbeth Iron Co. build revolving derricks, bridges and any special design of equipment for handling material, either with clam shell buckets, or without.

The Association of Passenger Steamer Stewards, organized in Detroit about a year ago, has been granted charter by the International Longshoremen, Marine & Transport Workers' Association. It is reported that the stewards of practically every big passenger line on the lakes are members of the organization.

NO COMPROMISE ON THE SHIPPING BILL.

The committee on ship subsidies and shipping of the Merchants' Association of New York has addressed a communication to the house committee on merchant marine and fisheries, opposing any compromise on the shipping bill. The communication reads:

"It is reliably reported to this committee that the so-called 'shipping interest' which advocates the enactment of H. R. 12,222, has asked the cordage interests, which oppose the enactment of that bill, to a conference, with a view of reconciling their respective positions and effecting some compromise. The attitude of this committee in opposing the proposed legislation has no regard for special or class interests, as opposed to the common weal. It is not believed that the industrial interests opposed to H. R. 12,222 will consent to any compromise, but whether they do or not, the Merchants' Association desires to inform your committee that it is unalterably opposed to the proposed restrictive legislation. In so far as the attitude of the industrial interests in the home markets and in the Philippine Islands and the shipping interests, in contradistinction to the ship owning interests, contend for a principle which shall be recognized in all legislation, they have

been supported by the Merchants' Association. If, however, these interests or any of them combine for the purpose of securing legislation inimical to other interests or to the general welfare, the position of the Merchants' Association remains unchanged, and this committee respectfully urges for the attentive consideration of the protest already submitted to you."

The Nernst Lamp Co. has appointed Mr. G. E. Bennett to act as district sales manager of their Buffalo district office, recently established at No. 17 West Mohawk street.

Cast Steel Pipes.

We have especial facilities for making and finishing steel pipes, crosses and tees and special fittings, to stand heavy pressures and up to ten feet in diameter. Our metal averages about 70,000 pounds tensile.

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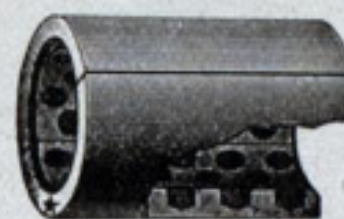
AGENCIES.

St. Louis: C. A. Thompson, 516 N. Third St.

San Francisco: John Woodlock, 154-156 First St.

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One set second hand steamboat machinery cylinders, 13½ inches diameter, 5 feet stroke. One steel shaft 26½ feet long, 7 feet diameter, complete. Also, copper supply pipe. Also, two smaller shafts and two nigger engines. One set machinery 10 inches diameter, 41-inch stroke. Four pilot wheels, 7 feet diameter. Apply Benton Transportation Company, Bismarck, N. D.



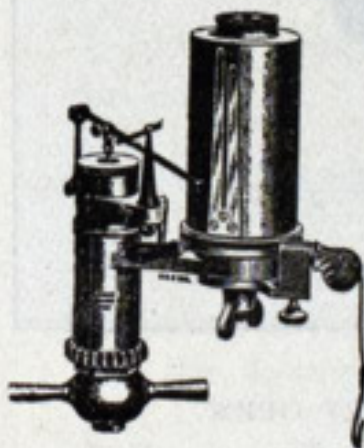
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"Otis" Fire Box Plates a Specialty.

SPEED AS A FACTOR IN LAUNCH BUILDING.

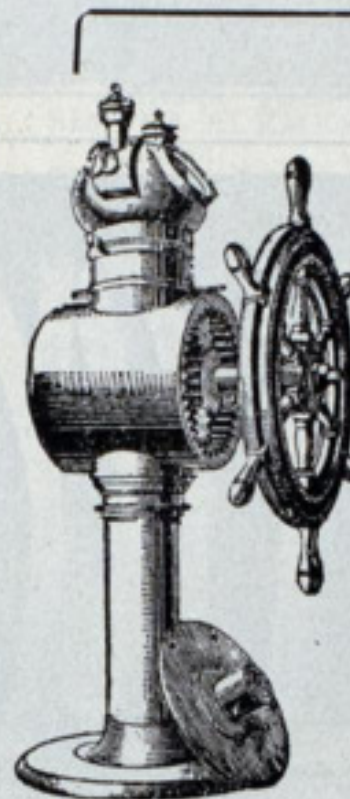
The Lozier Motor Co. of New York believe, with other leading builders in the motor boat industry, that the speed question is going to play an important part in motor boating this year, but they believe that the demand will be for a boat of moderate speed rather than for the extreme type of high-speed automobile racers. They are building a line of boats at their New York city works at the mouth of Westchester creek, and at present have the following sizes under construction: 28, 31, 33 and 40 ft. These boats are termed "semi-racers" and will have a speed which will enable them to very easily run away from the ordinary type of motor boat. For advertising purposes this company are building an automobile boat 25 ft. in length to attain a speed of 21 miles an hour. The hull will weigh less than 500 lbs. and will be equipped with a 24-30 Lozier automobile engine turning an 18 in. wheel 1,000 R. P. M. The total weight of the hull and engine will be less than 900 lbs. They also have an automobile racing boat 37 ft. in length in course of construction at their New York city shops. At the present time the Lozier Motor Co. have under construction in their boat works at Plattsburg, N. Y., 150 launches 21 and 25 ft. in length, 100 of which have been completed and are ready for delivery. At the New York city works in addition to the semi-racers and automobile boats, the following are being built: 50-ft. oyster boat; 32-ft. twin screw, shallow draught work boat for Texas; 21-ft. yacht's tender; 31-ft. cruising launch; 25-ft. boat with five windows forward, and several small tenders.

TRADE NOTES.

The Republic Rubber Co. of Youngstown announce the successful test of their White Shield brand of fire hose by the city of New York. The company reports that the specifications are the most rigid and exacting ever issued by any city.

In the short time since the Dake Engine Co. of Grand Haven, Mich., began making a steam steering gear they have placed about forty on lake vessels, late installations including such steamers as the Nyack, City of Milwaukee and City of Chicago. The Dake company is now making arrangements for installing four or five gears on vessels in New York harbor and has had several orders lately from the Canadian government. Nearly all orders of late are for gears for large vessels.

The Strothman Iron Co., Superior, Wis., have put on the market its patent propeller wheels. This wheel is so constructed that instead of throwing the water off at an angle with the line of the shaft, it more nearly diverts the line of force in a parallel with that of the shaft. Every pound of water that leaves the wheel flows directly back from the boat instead of being thrown off at an angle, and thereby losing a large percentage of the force. The vacuum directly in front of the wheel is inclosed, enabling the adjoining water to better pass in, thus forcing the boat ahead at a greater rate of speed. The blade being a plane surface makes a wide departure from the old styles of expanding pitch—has a perfect efficiency over the inner surface from the hub of the outer edge. It does not drag at the hub and fan the water on the outer extremity. The same principle that applies for forward motion applies also for backing. The company states that its patents are for sale.



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Steam Yacht "Huntress," built in 1880, now in first class repair; \$1,000 repairs to hull last fall. Carries 210 passengers. Will make 11 miles an hour all day; economical to run. Cost \$18,000. Cash price asked, \$6,000. Write for particulars C. S. Cadwallader, Secretary Smith, Davis & Co., Buffalo, N. Y.

Apr. 14

Steamer For Sale Cheap.

Wooden steamer Continental. Length, 244 ft; capacity, 2,000 gross tons ore, 2,000 net tons coal. For further particulars apply to M. A. Hanna & Co., Cleveland, O.

Apr. 7

Yacht for Sale.

New beautiful 100-ft. steam yacht, fully equipped. Owner physically unable to use yacht. Will sell for any reasonable offer. Yacht can be seen in Detroit. Address M. J. STEFFENS, 57 East Twenty-second st., Chicago. tf

For Sale.

Tug Duncan City. Address, Geo. Pankrantz, Lumber Co., Sturgeon Bay, Wis. tf

Steamer for Sale at Cost—\$13,500.

The old Anchor Line twin-screw steamer Gordon Campbell. Two decks, gangways, hoisting machinery, etc. Suited to carrying coal, lumber, ties, package freight, etc. Spent \$3,500 in repairs this year. Other business requires my undivided attention and I will sell for cost to me. W. F. Carroll, 1011 Ashland block, Chicago. tf

Marine Fire Box Boiler for Sale.

16 ft. long, 9 ft. 6 in. diameter; allowed 125 lbs. steam; in good condition. Price reasonable. Address Capt. John Green, 402 West Ferry St., Buffalo, N. Y. tf

Hydraulic Slings for Sale.

Hydraulic slings consisting of beam, cylinders, plungers, uprights, hydraulic and feed pumps, engine, etc., capable of raising 300 tons. Address McKinnon Mfg. Co., Bay City, Mich. tf

Tug for Sale.

Tug Frank Canfield, 75 ft. long. Engine 18 x 20, boiler 6½ x 13. Address Canfield Tug Line, Manistee, Mich. Apr. 28

Gasoline Launch for Sale.

Length 25 ft 6 in., beam 6 ft. Stationary roof and side curtains. 7½ H. P. Speed about 10 miles. In first class condition; almost new. Apply to Capt John Green, 402 W. Ferry St., Buffalo, N. Y. tf

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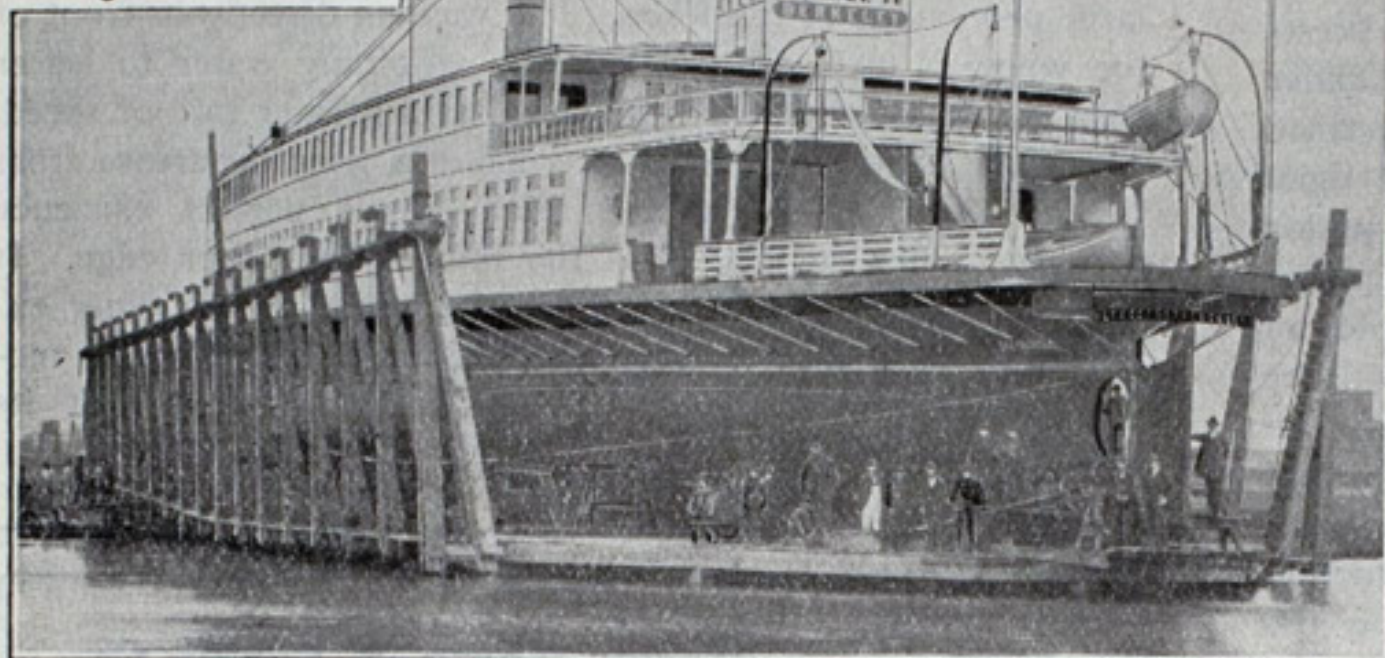
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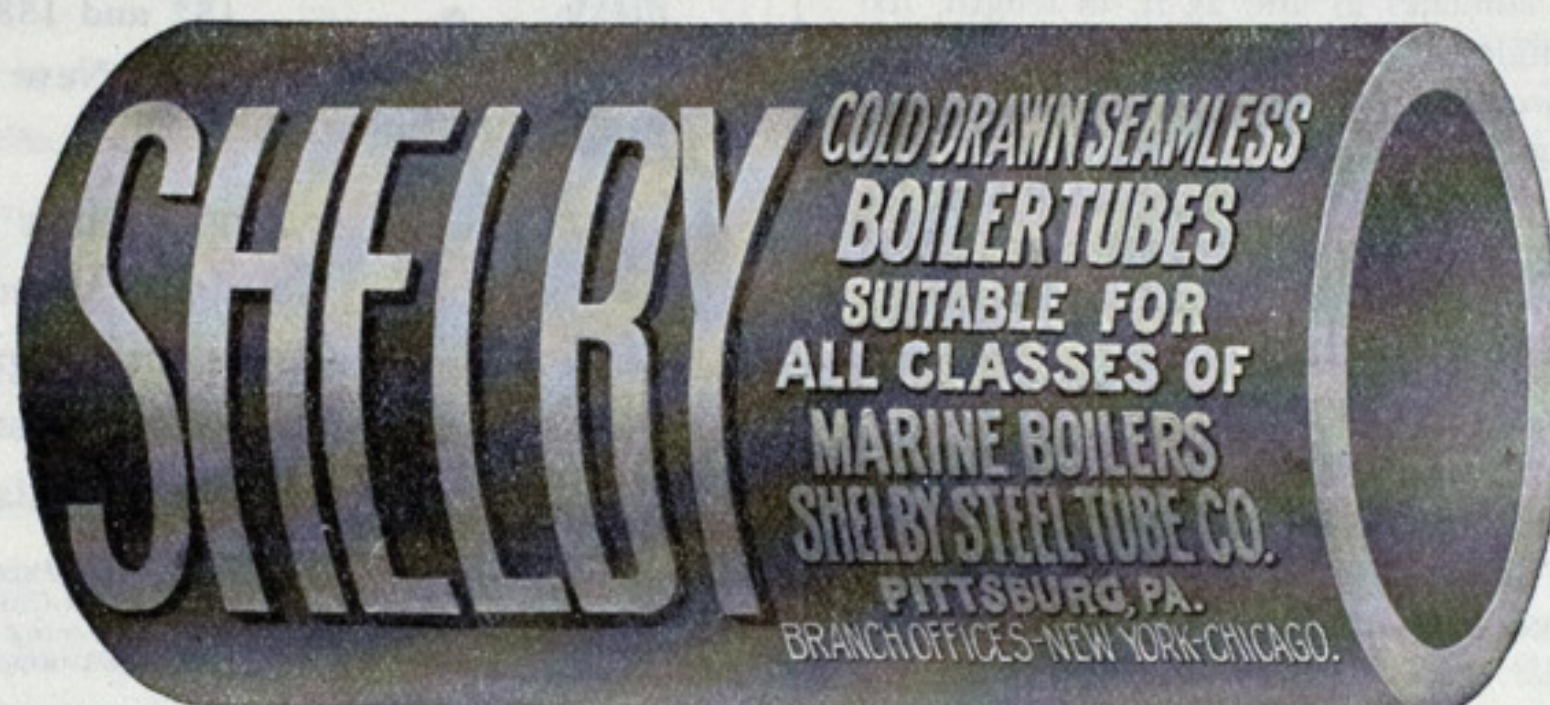
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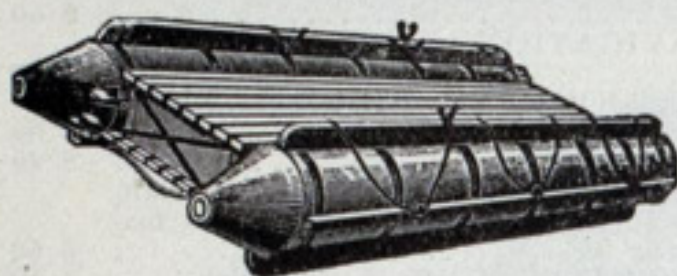


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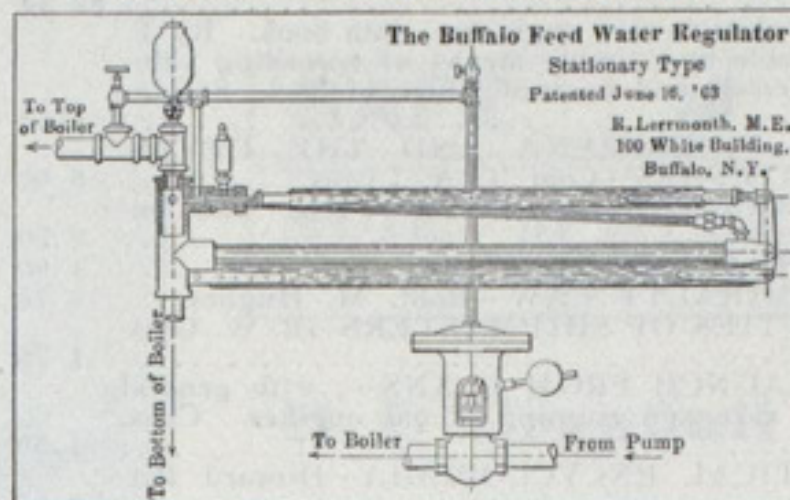
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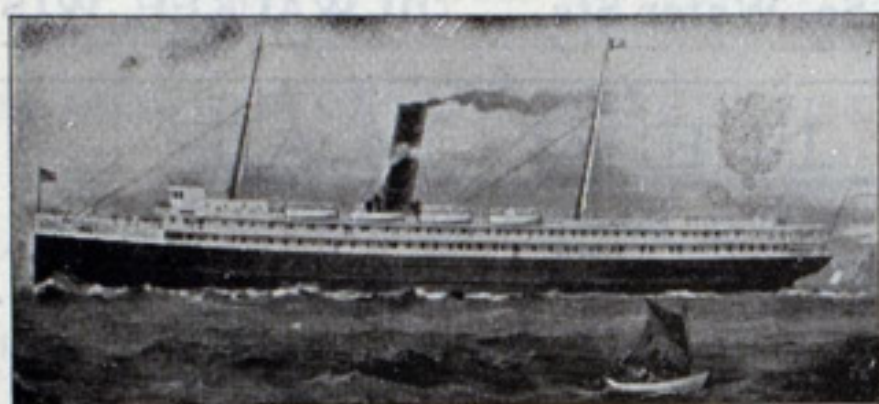
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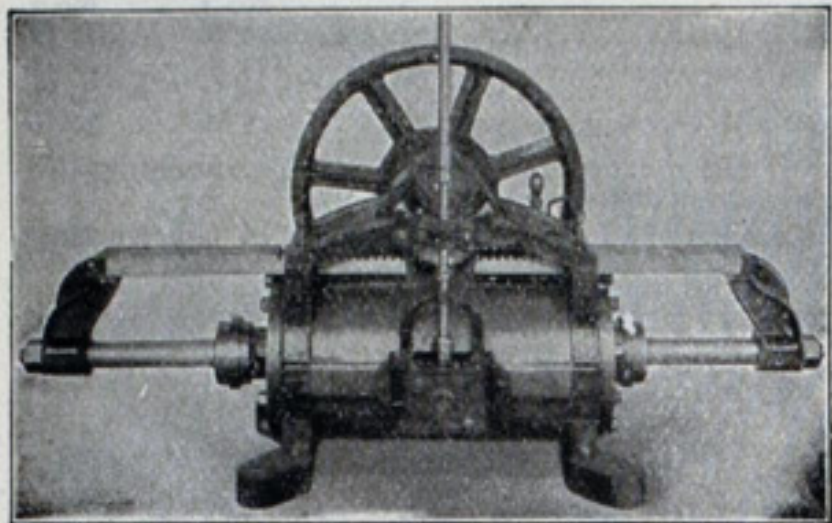
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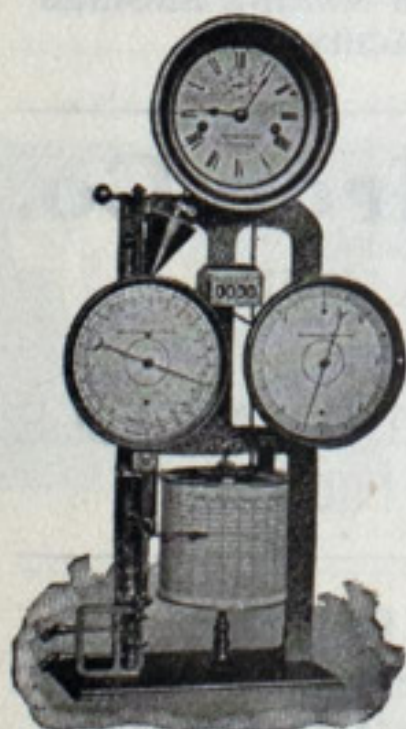
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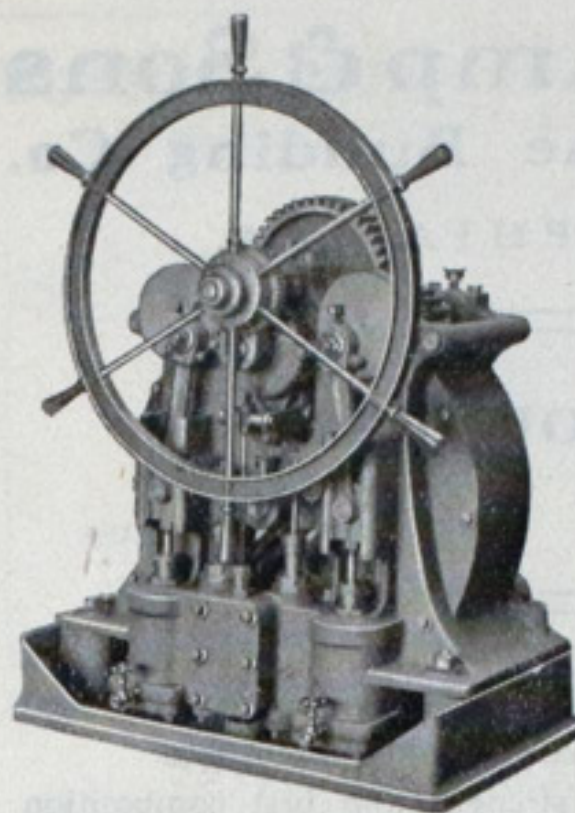
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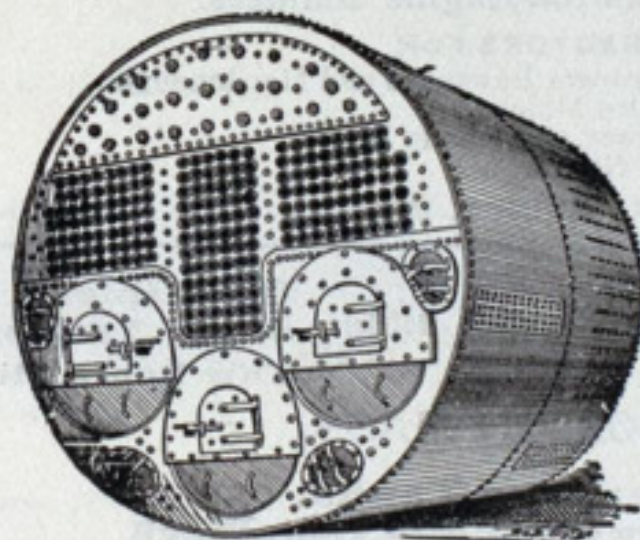
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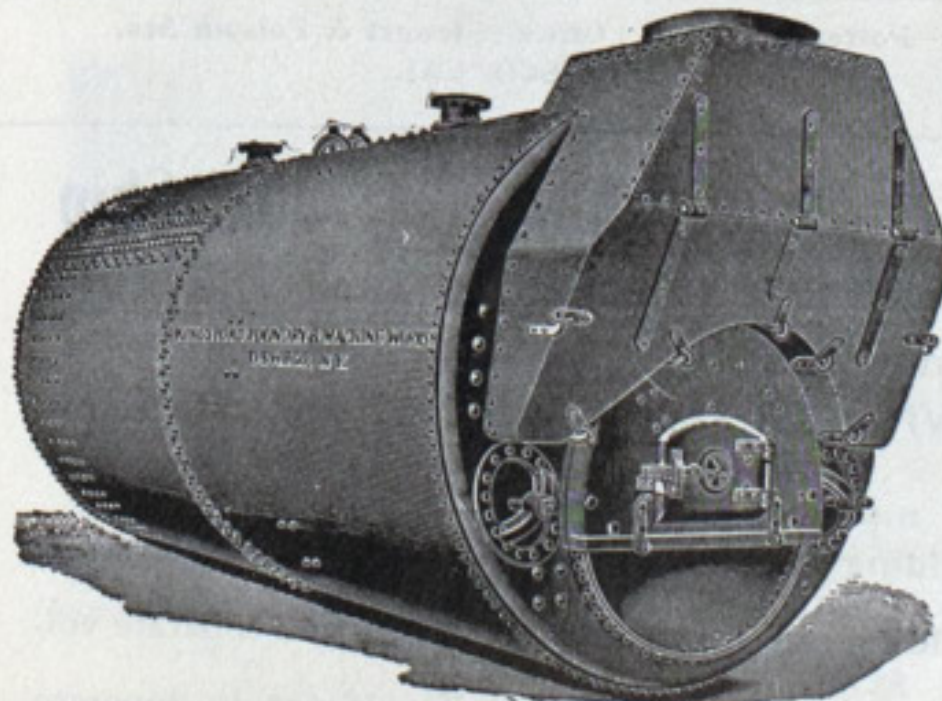
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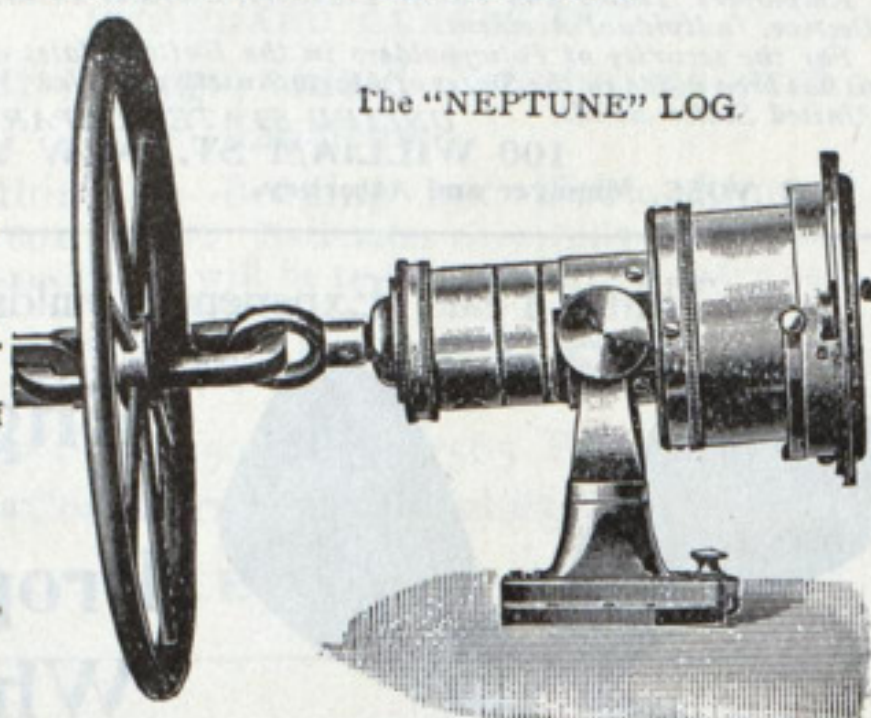
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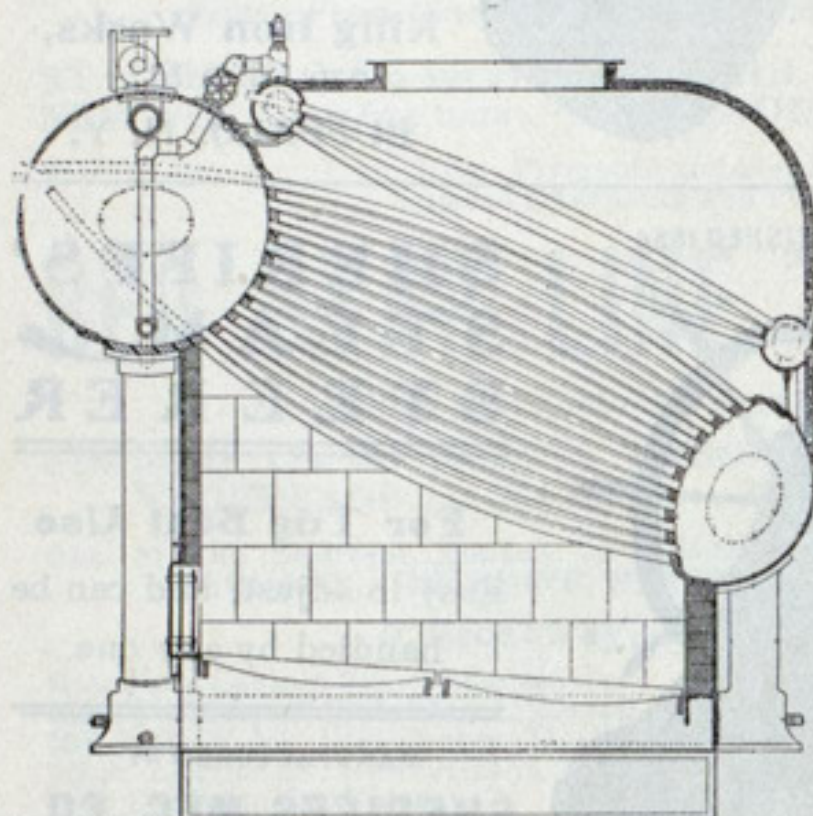
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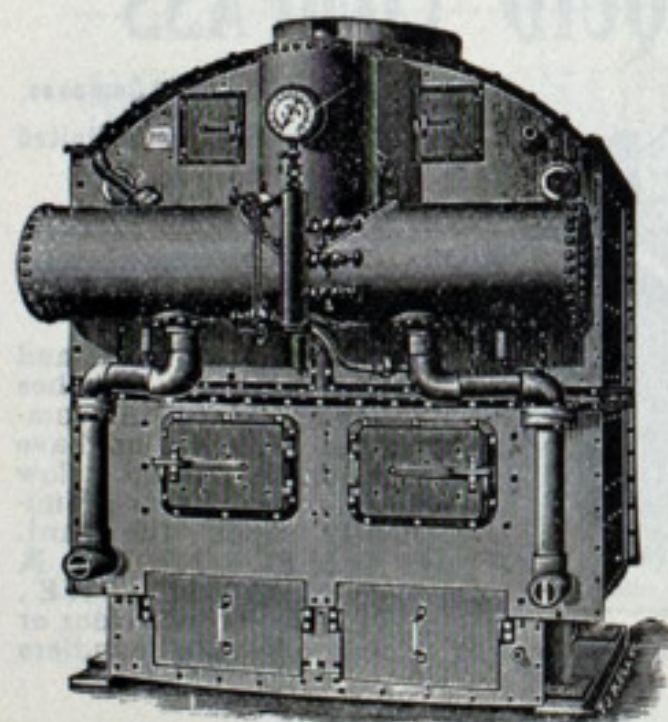


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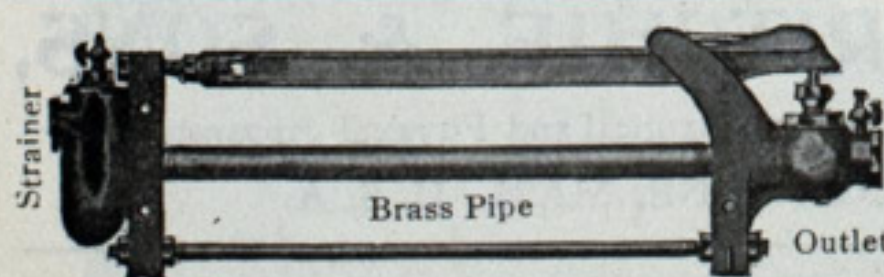
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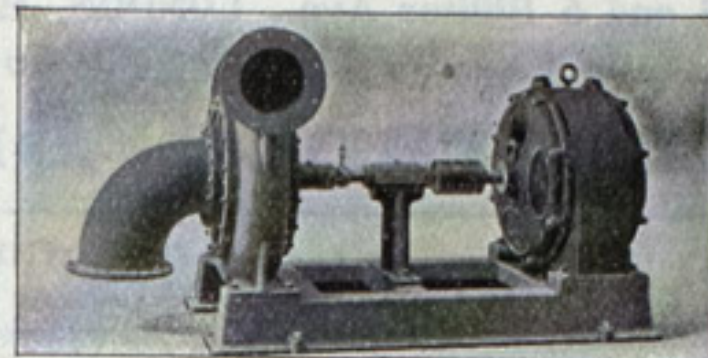
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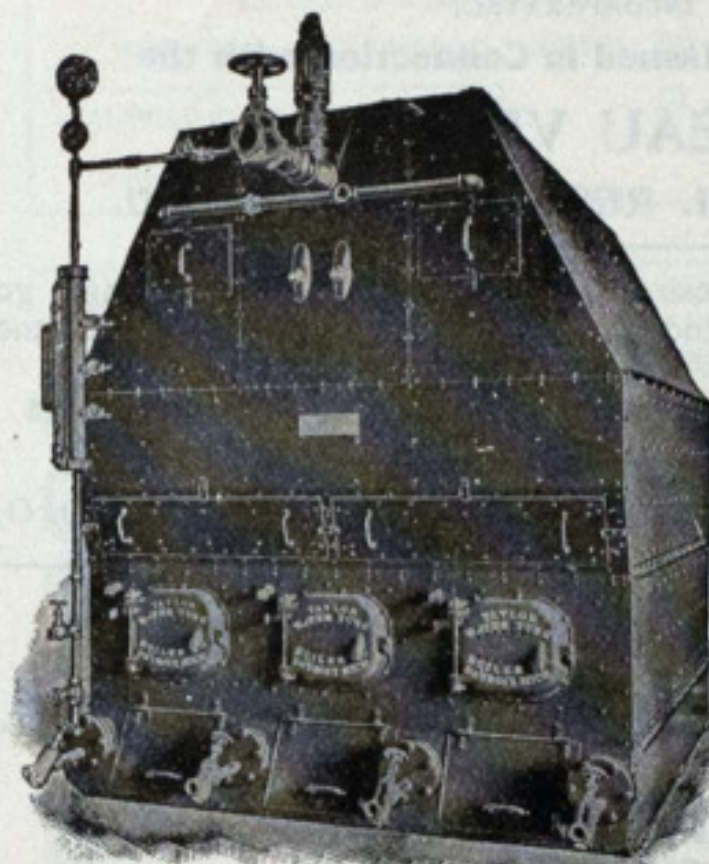
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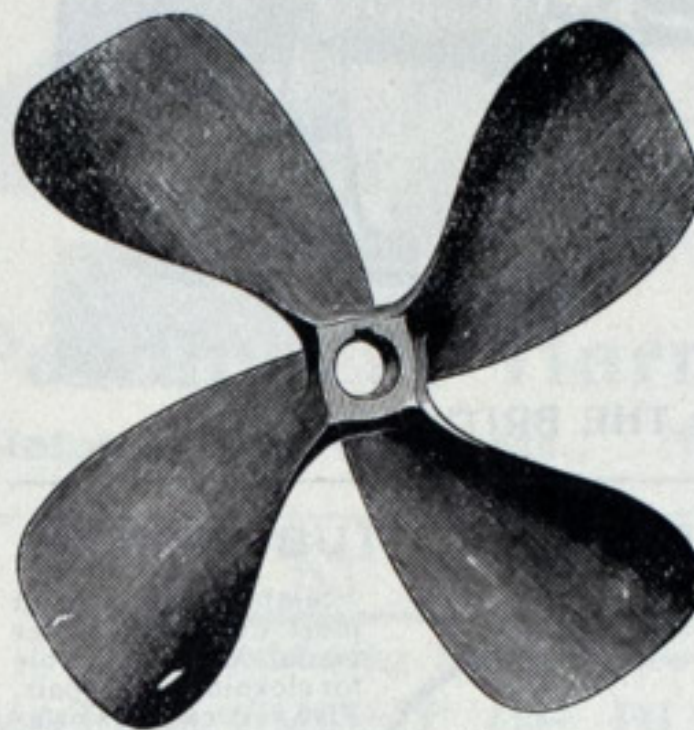
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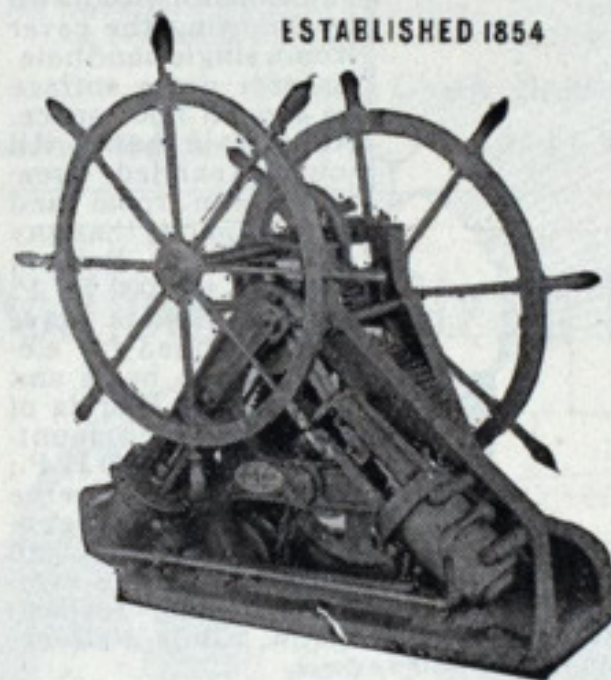
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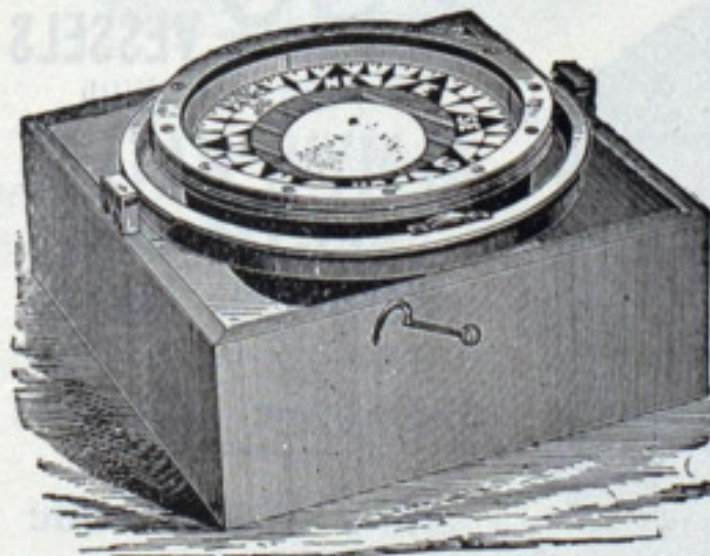
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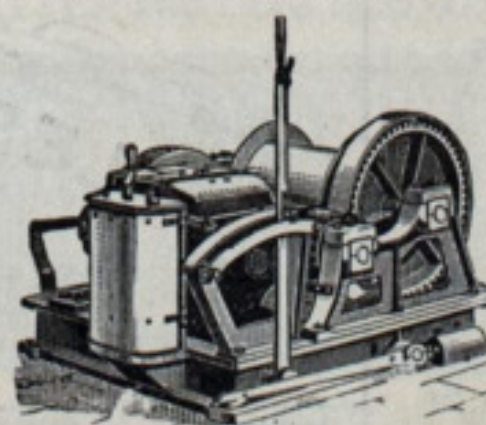
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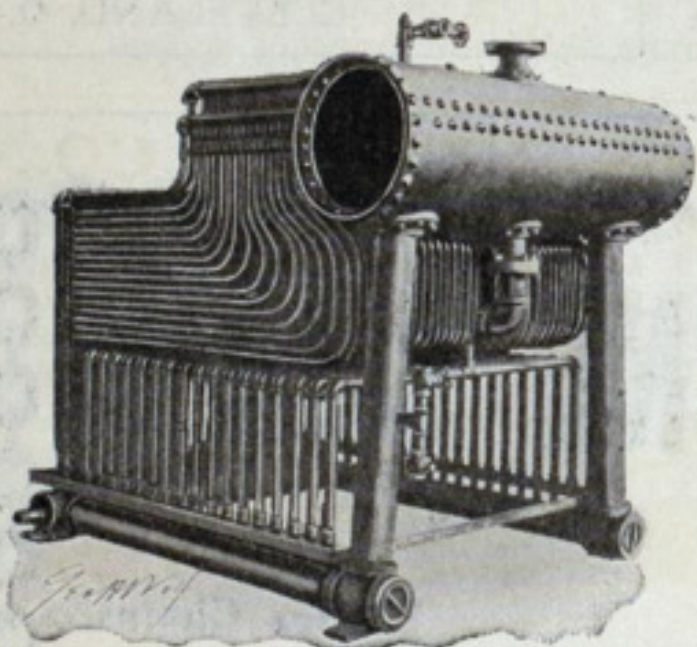


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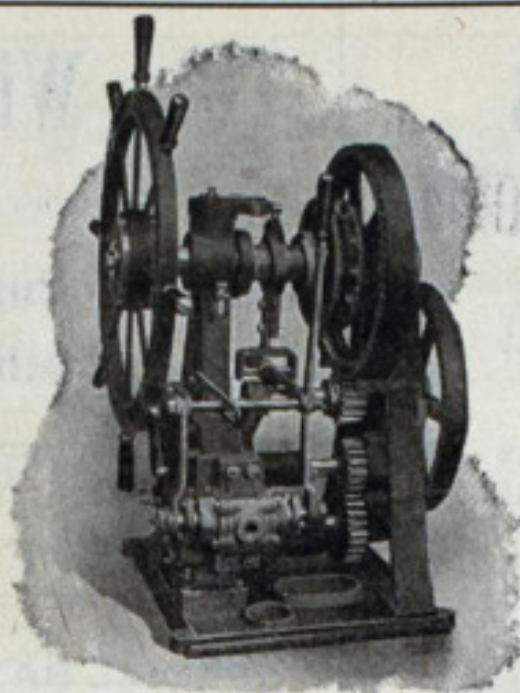


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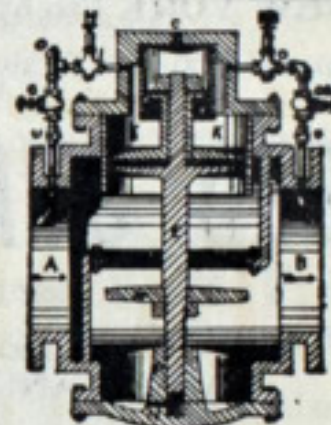
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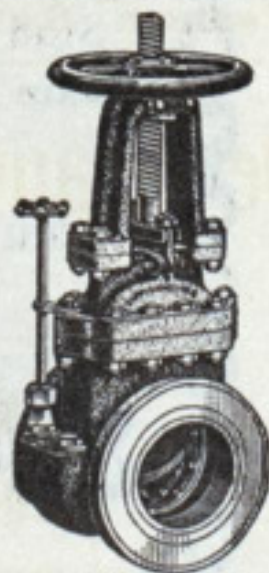
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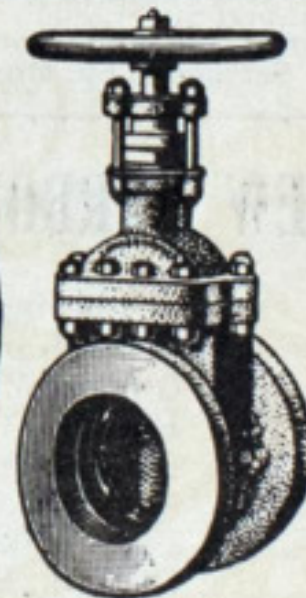
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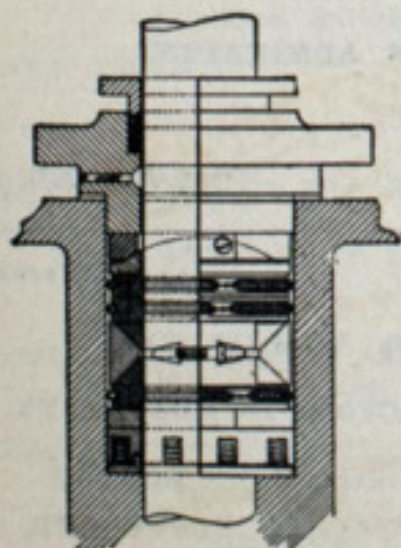
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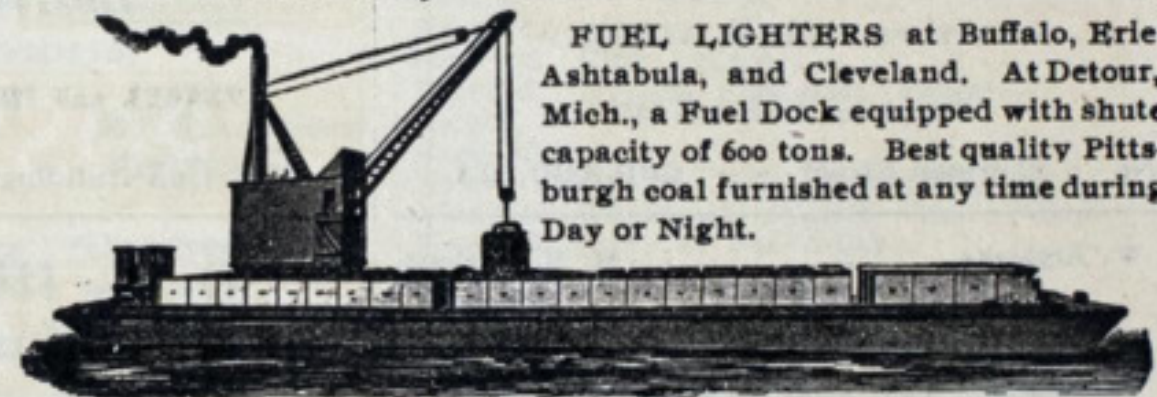
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CHARTS.

Marine Review Pub. Co.....Cleveland.
Potter, J. D.....London.

CLOCKS (Marine and Ship's Bell) AND CHRONOMETERS.

Ashton Valve Co.....Boston.
Bliss, John & Co.....New York.
Chelsea Clock Co.....Boston.
Ritchie, E. S. & Sons.....Brookline, Mass.

COAL PRODUCERS AND SHIPPERS.

Hanna, M. A. & Co.....Cleveland.
Plekands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Rochester & Pittsburg Coal & Iron Co.....Buffalo.

COAL AND ORE HANDLING MACHINERY.

Brown Hoisting Machinery Co (Inc.).....Cleveland.
Lidgerwood Mfg. Co.....New York.
Macbeth Iron Co.....Cleveland.

COMPASSES.

Ritchie, E. S. & Sons.....Brookline, Mass.

CONCRETE MIXERS.

Contractors Supply & Equipment Co.....Chicago.

CONDENSERS.

Great Lakes Engineering Works.....Detroit.
Thropp & Sons Co., John E.....Trenton, N. J.

CONTRACTORS SUPPLIES.

Contractors Supply & Equipment Co.....Chicago.

CONTRACTORS FOR PUBLIC WORKS.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.....Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H.....Milwaukee.

CORDAGE.

Baker & Co., H. H.....Buffalo.
DeGrauw, Aymar & Co.....New York.
Upson-Walton Co.....Cleveland.

CORK JACKETS AND RINGS.

Armstrong Cork Co.....Pittsburg, Pa.
Kahnweiler's Sons, D.....New York.
Lane & DeGroot.....Long Island City, N. Y.

CHAIN CONVEYORS, HOISTS.

Brown Hoisting Machinery Co (Inc.).....Cleveland.
General Electric Co.....Schenectady, N. Y.
Lidgerwood Mfg. Co.....New York.
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

CRANES, TRAVELING.

Brown Hoisting Machinery Co.....Cleveland.
Lidgerwood Mfg. Co.....New York.
Pawling & Harnischfeger.....Milwaukee.

DISTANCE FINDER.

Nicholson Ship Log Co.....Cleveland.

DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, A.....New York.

DREDGING CONTRACTORS.

Buffalo Dredging Co.....Buffalo.
Chicago & Gt. Lakes Dredge & Dock Co.....Chicago.
Dunbar & Sullivan Dredging Co.....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H.....Milwaukee.

DRYING APPARATUS.

Sturtevant, B. F. Co.....Boston.

DRY DOCKS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Manitowoc Dry Dock Co.....Manitowoc, Wis.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co.....Superior, Wis.
United States Ship Building Co.....New York.

Buyers' Directory of the Marine Trade.—Continued.

ELECTRIC HOISTS AND CRANES.

General Electric Co.....Schenectady, N. Y.
 Lidgerwood Mfg. Co.....New York.
 Pawling & Harnischfeger.....Milwaukee.
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

ELECTRIC LIGHT AND POWER PLANTS.

General Electric Co.....Schenectady, N. Y.
 Sturtevant, B. F. Co.....Boston.
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

ENGINE BUILDERS, MARINE.

American Ship Building Co.....Cleveland.
 Atlantic Works.....East Boston, Mass.
 Chicago Ship Building Co.....Chicago.
 Chase Machine Co.....Cleveland.
 Cramp, Wm. & Sons.....Philadelphia.
 Craig Ship Building Co.....Toledo, O.
 Dake Engine Co.....Grand Haven, Mich.
 Detroit Ship Building Co.....Detroit.
 Fletcher, W. & A. Co.....Hoboken, N. J.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit, Mich.
 Hall Bros.....Philadelphia.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Macbeth Iron Co.....Cleveland.
 Milwaukee Dry Dock Co.....Milwaukee.
 Mosher, Chas. D.....New York.
 Moulton Steering Engine Co.....New York.
 Newport News Ship Building Co.....Newport News, Va.
 Northwestern Steam Boiler & Mfg. Co.....Duluth, Minn.
 Risdon Iron Works.....San Francisco.
 Roach's Ship Yard.....Chester, Pa.
 Sheriffs Mfg. Co.....Milwaukee.
 Superior Ship Building Co.....Superior, Wis.
 Thorpp, J. E. & Sons Co.....Trenton, N. J.
 Trout, H. G.....Buffalo.
 United States Ship Building Co.....New York.
 Willard, Chas. P. & Co.....Chicago.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.
 Cory, Chas. & Son.....New York.

ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co.....Chicago.
 Kieley & Mueller.....New York.
 Lunkenheimer Co.....Cincinnati.
 Mooers & Co., H.....Milwaukee.
 New York Belting & Packing Co.....New York.
 Northwestern Steam Boiler & Mfg. Co.....Duluth, Minn.

ENGINEERS, MARINE, MECHANICAL,
CONSULTING.

Hynd, Alexander.....Cleveland.
 Hunt, Robt. W. & Co.....Chicago.
 Kidd, Joseph.....Duluth, Minn.
 Lovejoy, H. O.....Buffalo.
 Matteson & Drake.....Philadelphia.
 Mosher, Chas. D.....New York.
 Nacey, James.....Cleveland.
 Pittsburg Testing Laboratory, Ltd.....Pittsburg.
 Powell, Ambrose V.....Chicago.
 Rice, Henry.....Buffalo.
 Roelker, H. B.....New York.
 Sadler, Perkins & Field.....New York.
 Steel, Adam.....Cleveland.
 Wood, W. J.....Chicago.

FANS FOR VENTILATION, EXHAUST, ETC.

Sturtevant, B. F. Co.....Boston.

FEED WATER PURIFIERS AND HEATERS.

Learmonth, Robert.....Buffalo.
 Ross Valve Co.....Troy, N. Y.

FIXTURES FOR LAMPS, OIL OR ELECTRIC.

General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

FORGES.

Sturtevant, B. F. Co.....Boston.

FORGINGS FOR CRANK, PROPELLER OR
THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co.....Cleveland.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Macbeth Iron Co.....Cleveland.

FLUE WELDING.

Flx's, S. Sons.....Cleveland.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

FUELING COMPANIES AND COAL DEALERS.

Hanna, M. A. & Co.....Cleveland.
 Ironville Dock & Coal Co.....Toledo, O.
 Pickands, Mather & Co.....Cleveland.
 Pittsburg Coal Co.....Cleveland.
 Rochester & Pittsburg Coal & Iron Co.....Buffalo.
 Smith, Stanley B., & Co.....Detroit.
 Smith Coal & Dock Co., Stanley B.....Toledo, O.
 Youghiogheny & Lehigh Valley Coal Co.....Chicago.

GALLEY UTENSILS.

Meckes, John.....Cleveland.
 Siegel Cooper Co.....New York.

GASKETS, RUBBER.

New York Belting & Packing Co.....New York.

GAS BUOYS.

Safety Car Heating & Lighting Co.....New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co.....Cleveland.

GAUGES, STEAM AND VACUUM.

American Steam Gauge Co.....Boston.
 Ashton Valve Co.....Boston.
 Lunkenheimer Co.....Cincinnati.

GAUGES, WATER.

Bonner & Co., Wm. T.....Boston.
 Lunkenheimer Co.....Cincinnati.

GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

GROCERIES AND SUPPLIES.

Siegel Cooper Co.....New York.

HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

HEATING APPARATUS.

Sturtevant, B. F. Co.....Boston.

HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
 Brown Hoisting Machinery Co. (Inc.).....Cleveland.
 Chase Machine Co.....Cleveland.
 Elwell-Parker Electric Co.....Cleveland.
 General Electric Co.....New York.
 Hyde Windlass Co.....Bath, Me.
 Lidgerwood Mfg. Co.....New York.
 Marine Iron Co.....Bay City.
 Pawling & Harnischfeger.....Milwaukee.
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

HOSE, RUBBER.

New York Belting & Packing Co.....New York.

HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

ICE MACHINERY.

Great Lakes Engineering Works.....Detroit.
 Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co.....Boston.
 Ashton Valve Co.....Boston.

INJECTORS.

American Injector Co.....Detroit.
 Crane Co.....Chicago.
 Jenkins Bros.....New York.
 Lunkenheimer Co.....Cincinnati.
 Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.

Brown & Co.....Buffalo.
 Elphicke, C. W. & Co.....Chicago.
 Fleming & Co., P. H.....Chicago.
 Frankfort Marine, A. & P. G. Ins. Co.....New York.
 Gilchrist & Co., C. P.....Cleveland.
 Hawgood & Co., W. A.....Cleveland.
 Helm & Co., D. T.....Duluth.
 Hutchinson & Co.....Cleveland.
 McCarthy, T. R.....Montreal.

McCurdy, Geo. L.....Chicago.
 Mitchell & Co.....Cleveland.
 Peck, Chas. E. & W. F.....New York and Chicago.
 Prindiville & Co.....Chicago.
 Richardson, W. C.....Cleveland.
 Sullivan, D. & Co.....Chicago.
 Voss, F. D.....New York.
 Weeks, F. H.....New York.

IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland.
 Hanna, M. A. & Co.....Cleveland.
 Pickands, Mather & Co.....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Marine Construction & D. D. Co.....
Mariner's Harbor, S. I., N. Y.
 Truscott Boat Mfg. Co.....St. Joseph, Mich.
 Willard, Chas. P.....Chicago.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong Cork Co.....Pittsburg.
 Carley Life Float Co.....New York.
 Drein, Thos. & Son.....Wilmington, Del.
 Kahnweiler's Sons, D.....New York.
 Lane & DeGroot.....Long Island City, N. Y.
 Marine Construction & Dry Dock Co.....
Mariner's Harbor, S. I., N. Y.

LIGHTS, SIDE AND SIGNAL.

Russell & Watson.....Buffalo.

LOGS.

Nicholson Ship Log Co.....Cleveland.
 Walker & Sons, Thomas.....Birmingham, Eng.
 Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

LUBRICATORS.

Crane Co.....Chicago.
 Lunkenheimer Co.....Cincinnati.

LUMBER.

Martin-Barriss Co.....Cleveland.
 Shurick, F. S.....New York.

MACHINISTS.

Chase Machine Co.....Cleveland.
 Lockwood Mfg. Co.....East Boston, Mass.
 Macbeth Iron Co.....Cleveland.
 Mooers & Co., H.....Milwaukee.
 Union Machine & Boiler Co.....Cleveland.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I.....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.
 Meckes, John.....Cleveland.
 Siegel Cooper Co.....New York.
 Sterling & Welch Co.....Cleveland.
 Williams & Rodgers Co.....Cleveland.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
 Detroit Ship Building Co.....Detroit.
 Great Lakes Engineering Works.....Detroit.
 Sturtevant, B. F. Co.....Boston.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.
 U. S. Metallic Packing Co.....Philadelphia.

METAL POLISH.

Bertram's Oil Polish Co.....Boston.

MOTORS, GENERATORS—ELECTRIC.

General Electric Co.....Schenectady, N. Y.
 Sturtevant, B. F. Co.....Boston.
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

NAUTICAL INSTRUMENTS.

Ritchie, E. S. & Sons.....Brookline, Mass.

Buyers' Directory of the Marine Trade.—Continued.

NAVAL ARCHITECTS.

Hynd, Alexander Cleveland.
 Kidd, Joseph Duluth, Minn.
 Lovejoy, H. O. Buffalo.
 Matteson & Drake Philadelphia.
 Mosher, Chas. D. New York.
 Nacey, James Cleveland.
 Rice, Henry Buffalo.
 Sadler, Perkins & Field.....New York.
 Steel, Adam Cleveland.
 Wood, W. J. Chicago.

OAKUM.

DeGrauw, Aymar & Co.....New York
 Stratford Oakum Co Jersey City, N. J.

OIL FOR PAINTING.

Sipe & Co., James B.....Allegheny, Pa.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph.....Jersey City, N. J.
 Standard Oil Co.....Cleveland

PACKING.

American Steam Packing Co.....Boston.
 Crane Co. Chicago.
 Jenkins Bros. New York.
 Katzenstein, L. & Co.....New York.
 New York Belting & Packing Co.....New York.
 United States Metallic Packing Co....Philadelphia

PAINTS.

Baker, Howard H. & Co.....Buffalo.
 Detroit Varnish Co.....Detroit.
 Detroit White Lead Works.....Detroit.
 Forest City Paint and Varnish Co Cleveland.
 New Jersey Zinc Co.....New York.
 Sipe & Co., James B.....Allegheny, Pa.
 Upson-Walton Co. Cleveland

PATENT ATTORNEYS.

Thurston & Bates Cleveland

PATTERN SHOP MACHINERY.

Atlantic Works, Inc.....Philadelphia

PILE DRIVING AND SUBMARINE WORK.

Buffalo Dredging Co Buffalo
 Chicago & Gt. Lakes Dredge & Dock Co...Chicago
 Dunbar & Sullivan Dredging Co.....Buffalo.
 Fitz-Simon & Connell Co.....Chicago.
 Smith Co., L. P. & J. A.....Cleveland.
 Starke Dredge & Dock Co., C. H.....Milwaukee.

PIPE, WROUGHT IRON.

Bourne-Fuller Co.....Cleveland.
 Crane Co. Chicago
 Macbeth Iron Co. Cleveland

PLANING MILL MACHINERY.

Atlantic Works, Inc.....Philadelphia

PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co. Cleveland

PLUMBING, MARINE.

Sands, Alfred B. & Son.....New York

PNEUMATIC TOOLS.

Allen, John F.....New York.

POLISH FOR METALS.

Bertram's Oil Polish Co.....Boston

PRESSURE REGULATORS.

Kieley & Mueller New York.
 Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
 Atlantic Works East Boston, Mass.
 Cramp, Wm. & Sons.....Philadelphia.
 Detroit Ship Building Co.....Detroit.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit.
 Hyde Windlass Co.....Bath, Me.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Macbeth Iron Co.....Cleveland.
 Milwaukee Dry Dock Co.....Milwaukee.
 Newport News Ship Building Co.Newport News, Va.
 Phosphor Bronze Smelting Co., Ltd.....Philadelphia.
 Risdon Iron Works San Francisco.
 Roelker, H. B.....New York.
 Sheriffs Mfg. Co.....Milwaukee.
 Superior Shipbuilding Co.....Superior, Wis.
 Thropp & Sons Co., J. E.....Trenton, N. J.
 Trout, H. G.....Buffalo.
 United States Ship Building Co.....New York.

PROJECTORS, ELECTRIC.

Bogue, Chas. J. New York.
 General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
 Great Lakes Engineering Works.....Detroit.
 Kingsford Foundry & Machine Wks..Oswego, N. Y.

PUNCHES, RIVETERS, SHEARS.

Allen, John F.....New York.

RANGES.

Russell & Watson Buffalo.
 Siegel Cooper Co.....New York.

REFRIGERATING APPARATUS.

Great Lakes Engineering Works.....Detroit.
 Roelker, H. B.....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register Cleveland.
 Record of American & Foreign Shipping..New York.

RIVETING MACHINES.

Allen, John F.....New York.

RIVETS, STEEL, FOR SHIPS AND BOILERS.

Bourne-Fuller Co.....Cleveland.

SAFETY VALVES.

American Steam Gauge Co.....Boston.
 Ashton Valve Co.....Boston.
 Crane Co. Chicago.
 Hayden Mfg. Co., N. L.....Columbus, O.
 Lunkenheimer Co. Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co.....Buffalo.
 Upson-Walton Co.....Cleveland.
 Wilson & Silsby Boston.

SALVAGE COMPANIES.

See Wrecking Companies.

SEARCH LIGHTS.

Bogue, Chas. J. New York.
 General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co....Pittsburg, Pa.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne-Fuller Co.....Cleveland

SHIP BUILDERS.

American Ship Building Co.....Cleveland.
 Atlantic Works East Boston, Mass.
 Buffalo Dry Dock Co.....Buffalo.
 Cramp, Wm. & Sons.....Philadelphia.
 Craig Ship Building Co.....Toledo, O.
 Chicago Ship Building Co.....Chicago.
 Detroit Ship Building Co.....Detroit.
 Fore River Ship & Engine Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Manitowoc Dry Dock Co.....Manitowoc, Wis.
 Milwaukee Dry Dock Co.....Milwaukee.
 Newport News Ship Building Co.Newport News, Va.
 Risdon Iron Works San Francisco.
 Roach's Ship Yard.....Chester, Pa.
 Shipowner's Dry Dock Co.....Chicago.
 Smith & Son, Abram Algonac, Mich.
 United States Ship Building Co.....New York.
 Willard, Chas. P. & Co.....Chicago.

SHIP CHANDLERS.

Baker, Howard H. & Co.....Buffalo.
 Reilly Repair & Supply Co., James.....New York.
 Upson-Walton Co.....Cleveland.

SHIP LANTERNS AND LAMPS.

Russell & Watson Buffalo.

SHIP TIMBER.

Martin-Barriss Co. Cleveland.
 Shurick, F. S.....New York.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW, OR, SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

STEAM VESSELS FOR SALE.

Elwell, Jas. W. & Co.....New York.
 Gilchrist & Co., C. P.....Cleveland.
 Holmes, Samuel New York.
 McCarthy, T. R.....Montreal, Can.
 Weeks, F. H.....New York.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
 International Mercantile Marine Co....Philadelphia.
 Pere Marquette R. R. & S. S. Line.....Milwaukee.
 Red Star Line New York.

STEEL CASTINGS.

Seaboard Steel Casting Co.....Chester, Pa.
 Macbeth Iron Co.....Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
 Chase Machine Co.....Cleveland.
 Dake Engine Co.....Grand Haven, Mich.
 Detroit Ship Building Co.....Detroit.
 Hyde Windlass Co.....Bath, Me.
 Jenks Ship Building Co.....Port Huron, Mich.
 Moulton Steering Engine Co.....New York.
 Pawling & Harnischfeger Milwaukee.
 Sheriffs Mfg. Co. Milwaukee.

STOCKS, BONDS, SECURITIES.

Fahey & Co.....Cleveland.

SUBMARINE DIVING APPARATUS.

Morse & Son, A. J.....Boston.
 Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Gaskin, Edward Buffalo.
 Hynd, Alexander Cleveland.
 Lovejoy, H. O. Buffalo.
 Matteson & Drake Philadelphia.
 Nacey, James Cleveland.
 Rice, Henry Buffalo.
 Steel, Adam Cleveland.
 Wood, W. J.....Chicago.

TESTS OF MATERIALS.

Hunt, Robert W. & Co.....Chicago.
 Pittsburg Testing Laboratory Ltd.....Pittsburg.

TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co.....New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F.....New York.
 Watson-Stillman Co. New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
 Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co....Kingston, Ont.
 Midland Towing & Wrecking Co., Ltd.Midland, Ont.

TRAPS, STEAM.

Kieley & Mueller New York.
 Lunkenheimer Co. Cincinnati.
 Sturtevant Co., B. F., Jamaica Plain.....Boston.

Buyers' Directory of the Marine Trade.—Continued.

TRUCKS.		VESSEL AND FREIGHT AGENTS.		WHISTLES, STEAM.	
Boston & Lockport Block Co.....	Boston.	Boland, John J.....	Buffalo.	American Steam Gauge Co.....	Boston.
TUBING, SEAMLESS.		Brown & Co.....	Buffalo.	Ashton Valve Co.....	Boston.
Shelby Steel Tube Co.....	Pittsburg, Pa.	Elwell, Jas. W. & Co.....	New York.	Lunkenheimer Co.....	Cincinnati.
VALVES, STEAM SPECIALTIES, ETC.		Elphicke, C. W. & Co.....	Chicago.	WINDLASSES.	
American Steam Gauge Co.....	Boston.	Fleming & Co., P. H.....	Chicago.	American Ship Windlass Co.....	Providence, R. I.
Ashton Valve Co.....	Boston.	Gilchrist & Co., C. P.....	Cleveland.	American Ship Building Co.....	Cleveland.
Crane Co.....	Chicago.	Hall & Root.....	Buffalo.	Hyde Windlass Co.....	Bath, Me.
Jenkins Bros.....	New York.	Helm & Co., D. T.....	Duluth.	Jenks Ship Building Co.....	Port Huron, Mich.
Kieley & Mueller.....	New York.	Hawgood & Co., W. A.....	Cleveland.	WINCHES.	
Lunkenheimer Co.....	Cincinnati.	Holmes, Samuel.....	New York.	American Ship Windlass Co.....	Providence, R. I.
Mooers & Co., H.....	Milwaukee.	Hutchinson & Co.....	Cleveland.	Hyde Windlass Co.....	Bath, Me.
Ross Valve Co.....	Troy, N. Y.	McCarthy, T. R.....	Montreal.	WOOD WORKING MACHINERY.	
VALVES FOR WATER AND GAS.		Mitchell & Co.....	Cleveland.	Atlantic Works, Inc.....	Philadelphia.
Ross Valve Co.....	Troy, N. Y.	Prindiville & Co.....	Chicago.	WRECKING AND SALVAGE COMPANIES.	
VARNISHES.		Richardson, W. C.....	Cleveland.	Donnelly Salvage & Wrecking Co.....	Kingston, Ont.
Detroit Varnish Co.....	Detroit.	Sullivan, D. & Co.....	Chicago.	Midland Towing & Wrecking Co., Ltd.	Midland, Ont.
Detroit White Lead Works.....	Detroit.	Weeks, F. H.....	New York.	YACHT AND BOAT BUILDERS.	
Forest City Paint & Varnish Co.....	Cleveland.	WATER GAUGES.		Drain, Thos. & Son.....	Wilmington, Del.
New Jersey Zinc Co.....	New York.	Bonner & Co., Wm. T.....	Boston.	Lane & DeGroot.....	Long Island City, N. Y.
Also Ship Chandlers.		Lunkenheimer Co.....	Cincinnati, O.	Marine Construction & Dry Dock Co.....	New York.
VENTILATING APPARATUS FOR SHIPS.		VESSEL FURNISHINGS.		Truscott Boat Mfg. Co.....	St. Joseph, Mich.
Sturtevant, B. F. Co.....	Boston.	Meckes, John.....	Cleveland.	Willard, Chas. P. & Co.....	Chicago.
		Siegel Cooper Co.....	New York.	YAWLS.	
		Sterling & Welch Co.....	Cleveland.	Drain, Thos. & Son.....	Wilmington, Del.
		Williams & Rodgers Co.....	Cleveland.	Lane & DeGroot.....	Long Island City, N. Y.
		WIRE ROPE AND WIRE ROPE FITTINGS.			
		Baker, H. H. & Co.....	Buffalo.		
		DeGrauw, Aymar & Co.....	New York.		
		Upson-Walton Co.....	Cleveland.		

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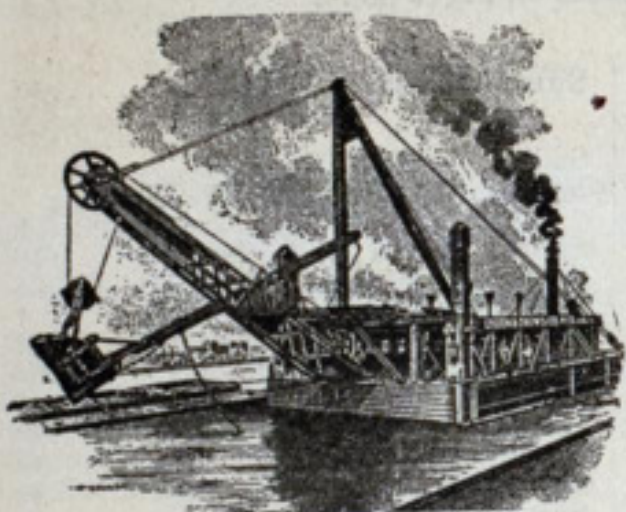
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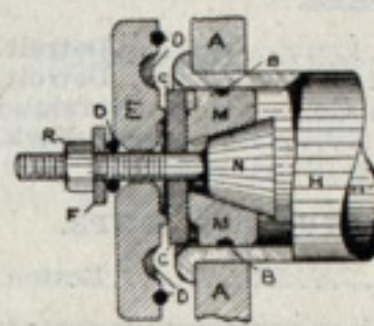
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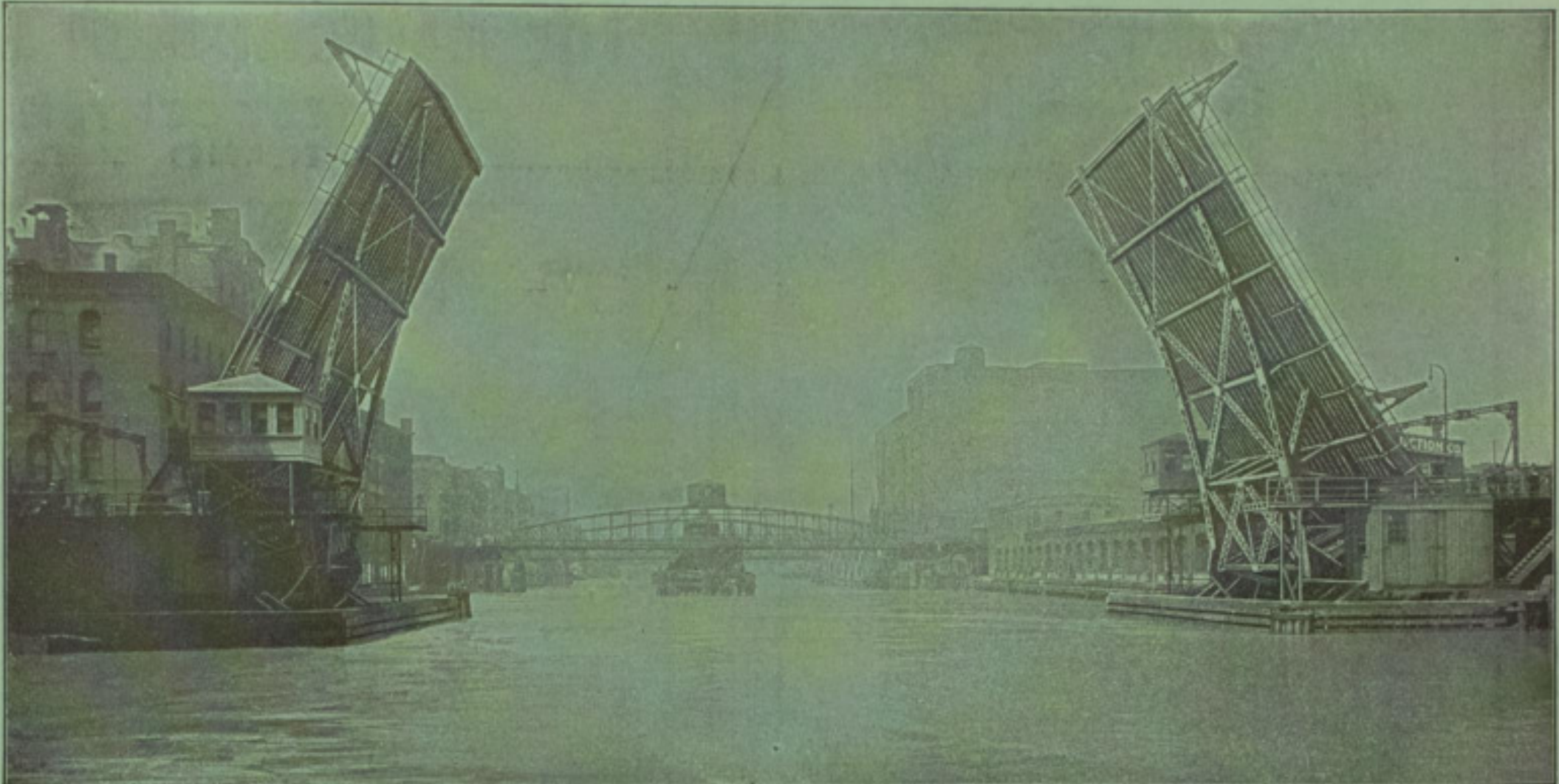
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..... *3:10pm
..... †4:30pm
*5:40pm *5:45pm
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†8:10am

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..... †6:00am
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†11:10am
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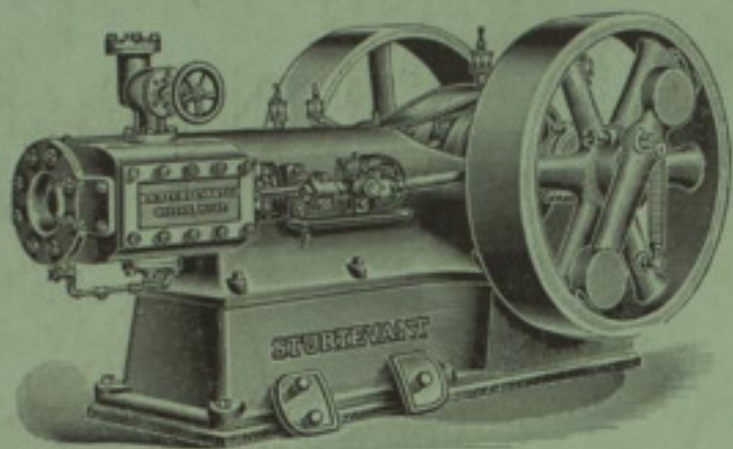
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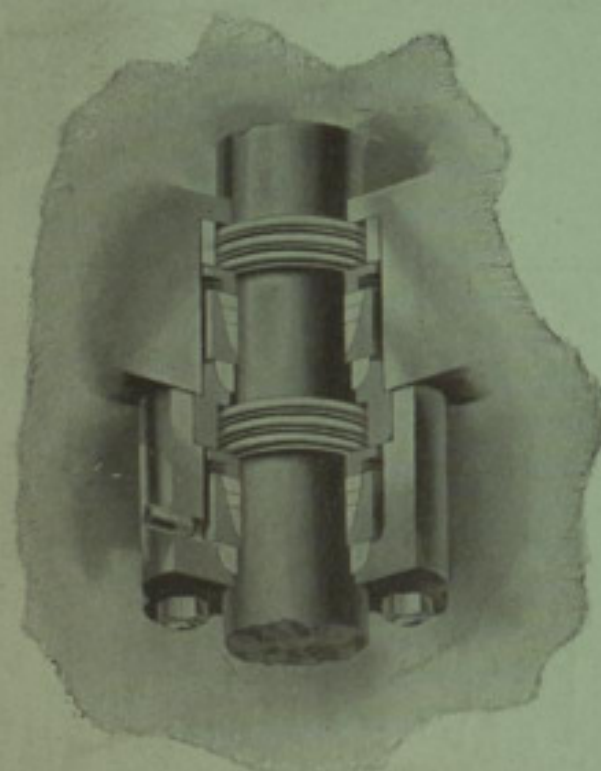


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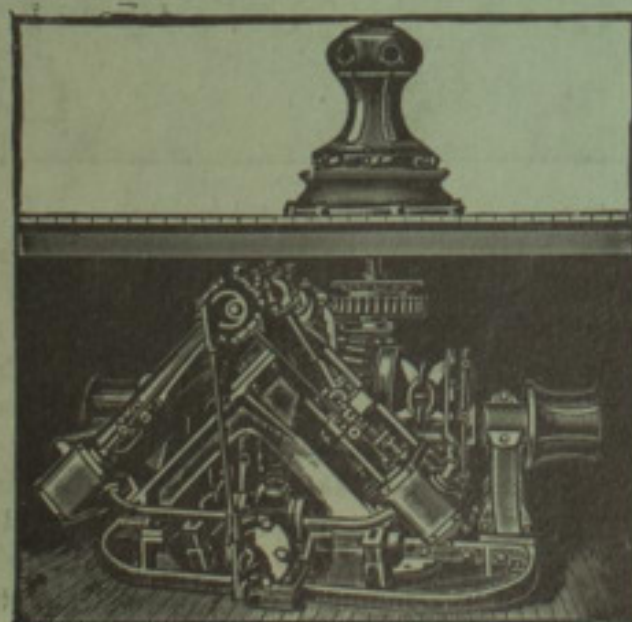
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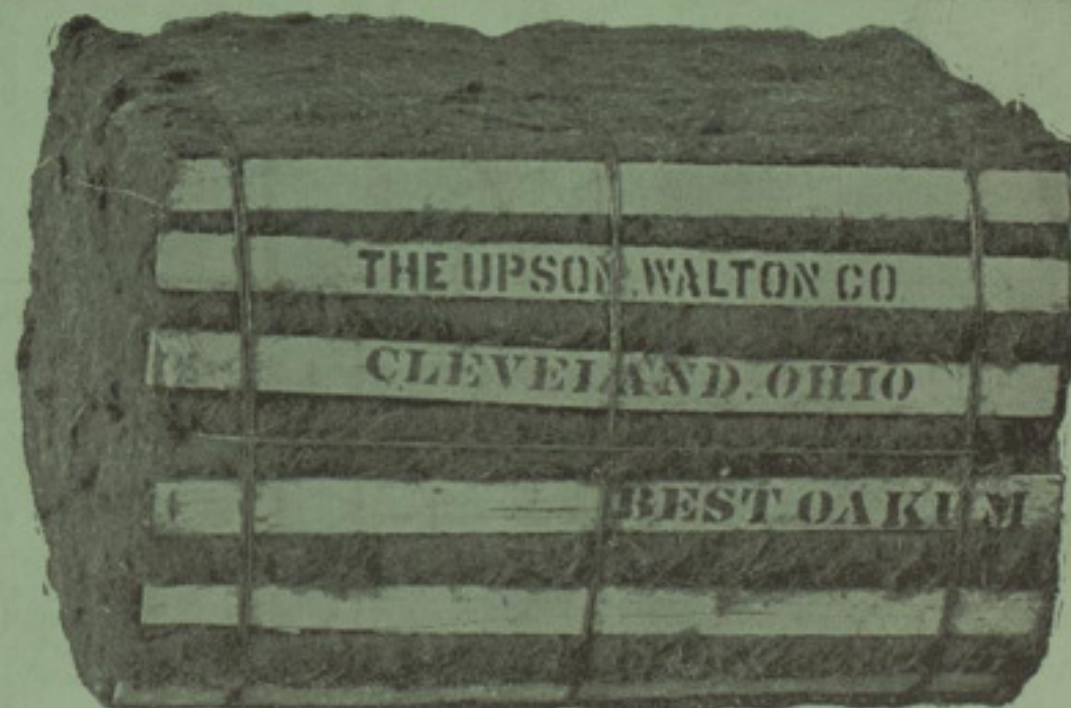
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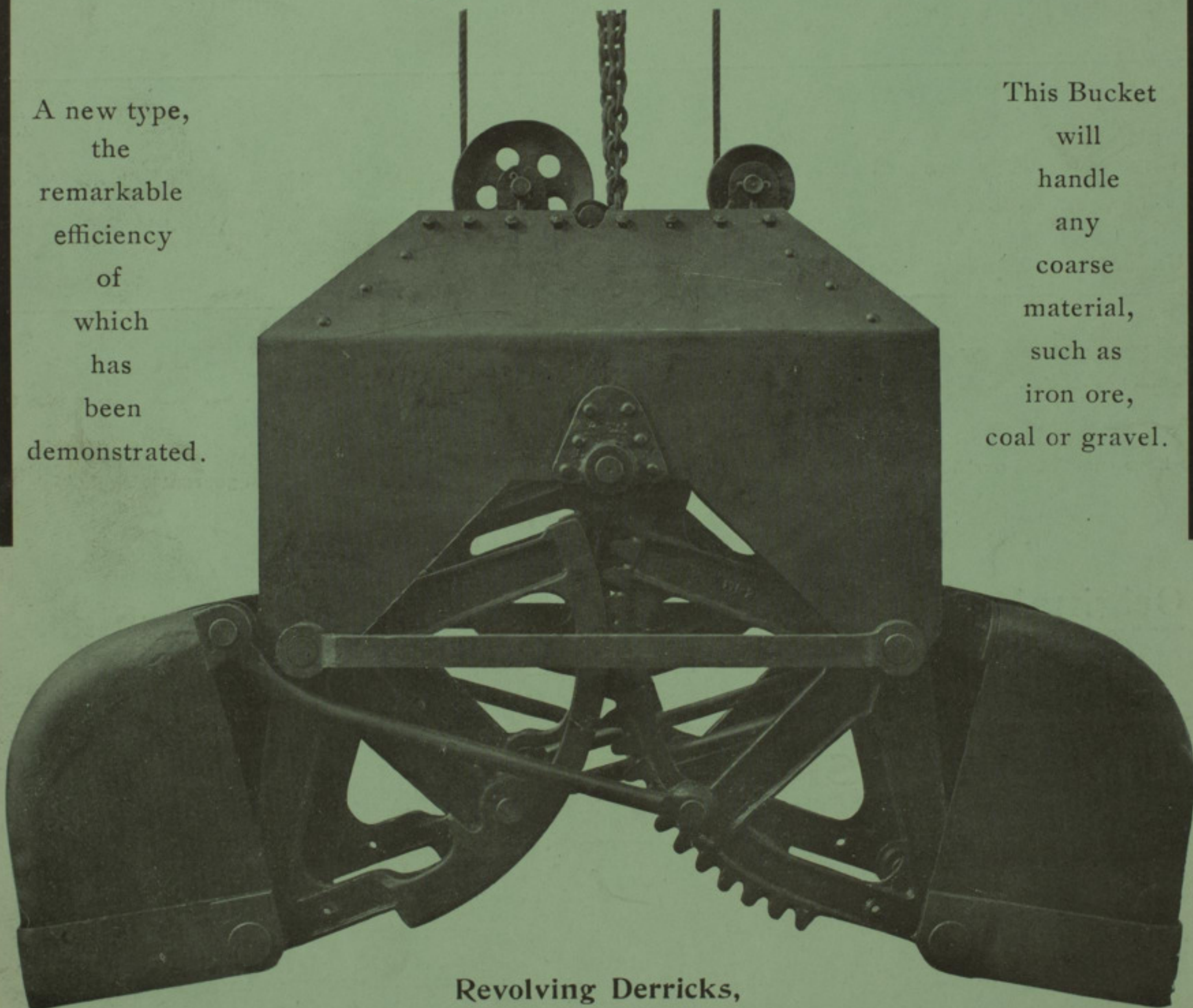
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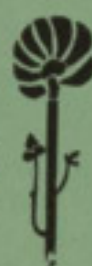
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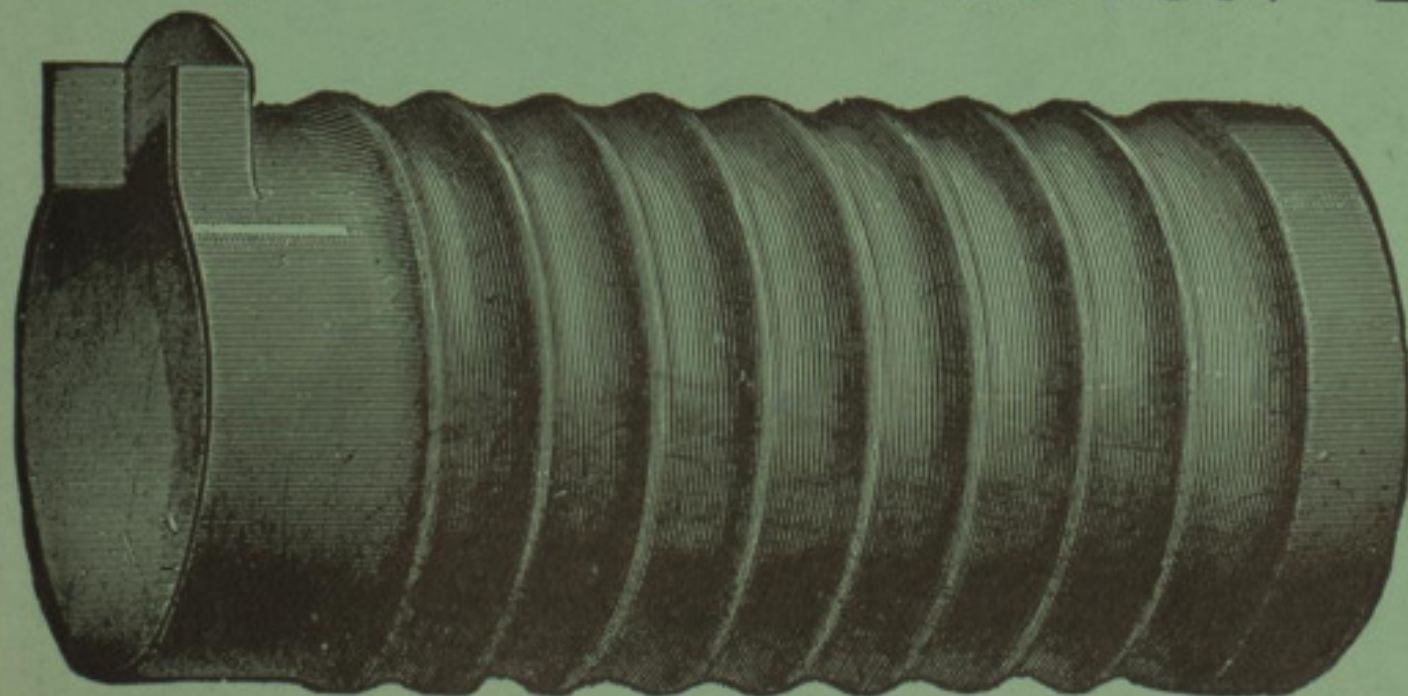
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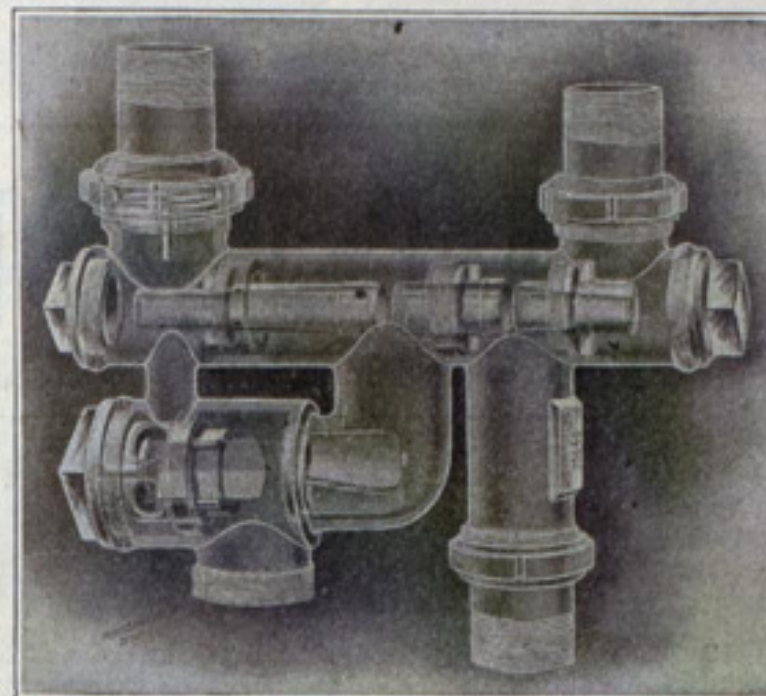
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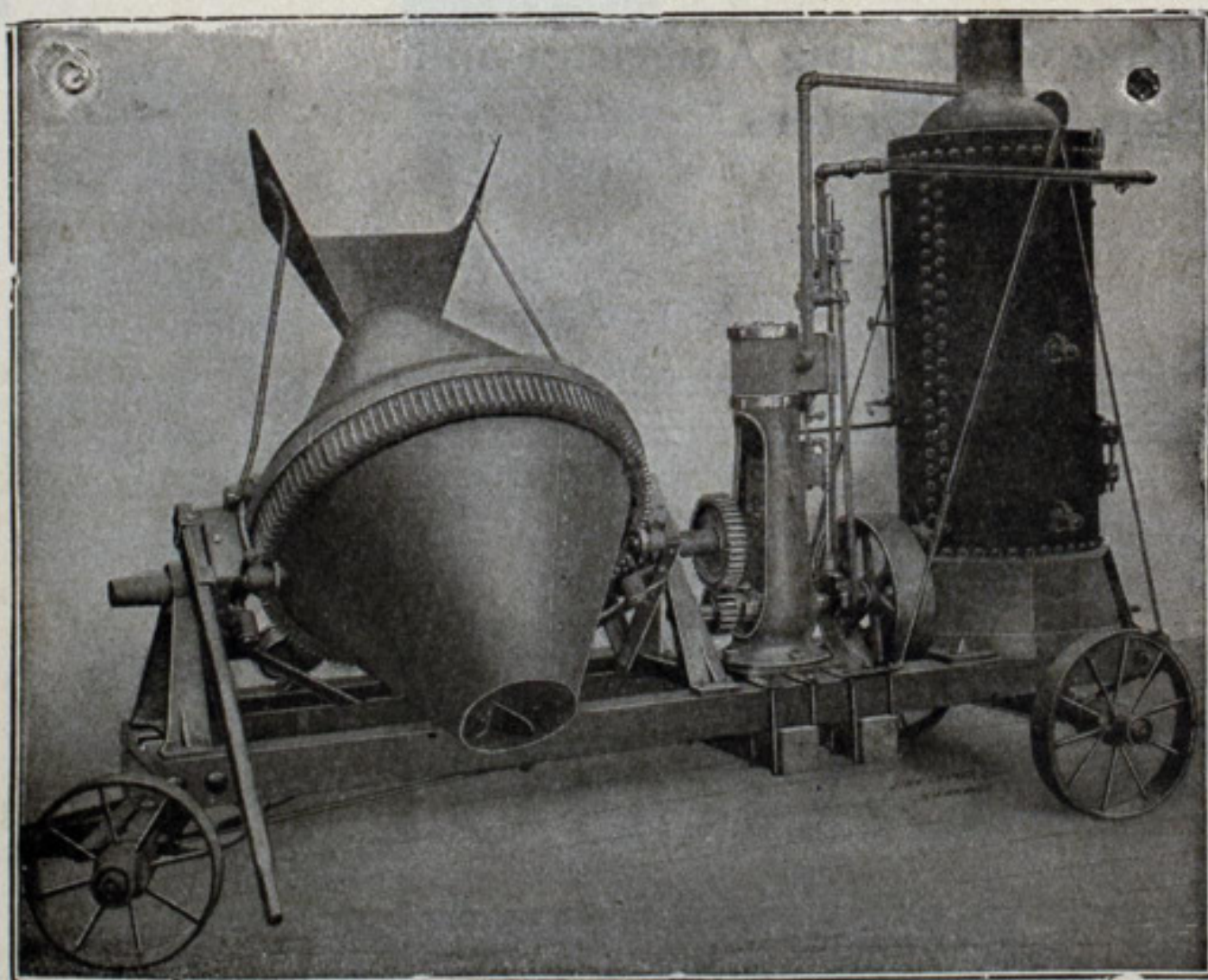
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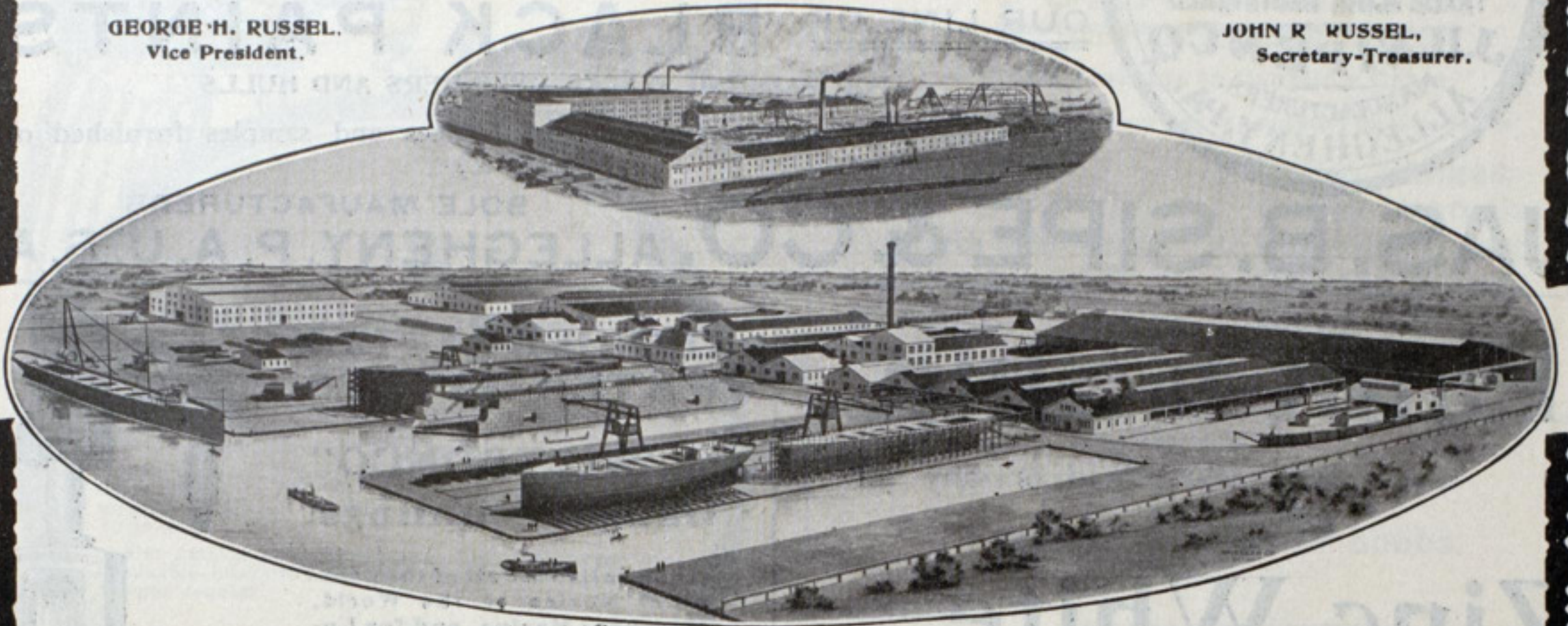
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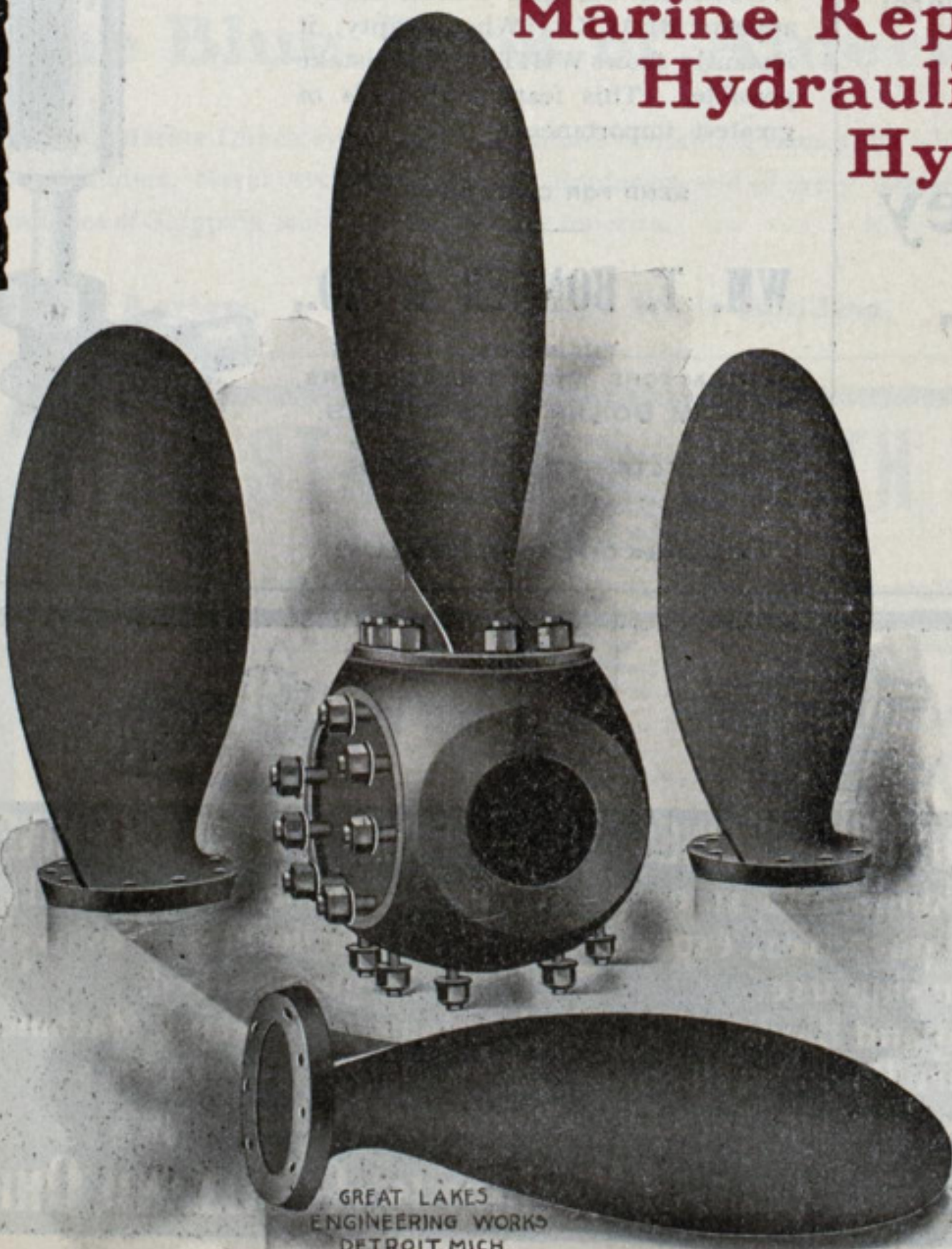
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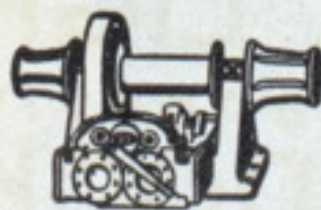
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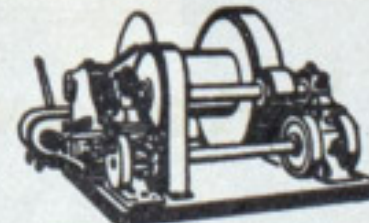
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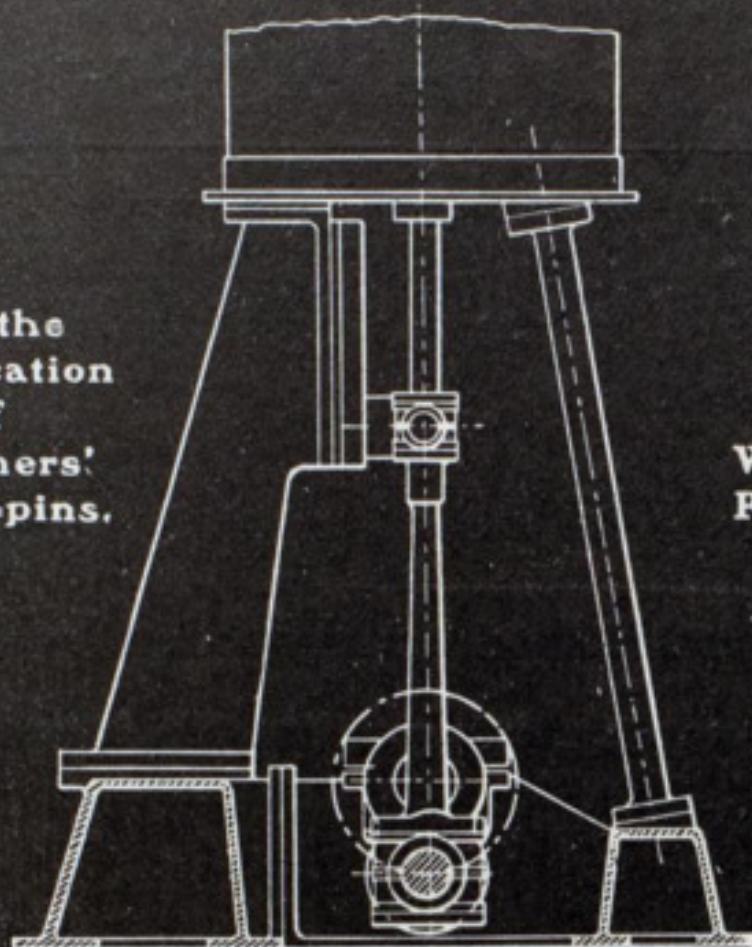
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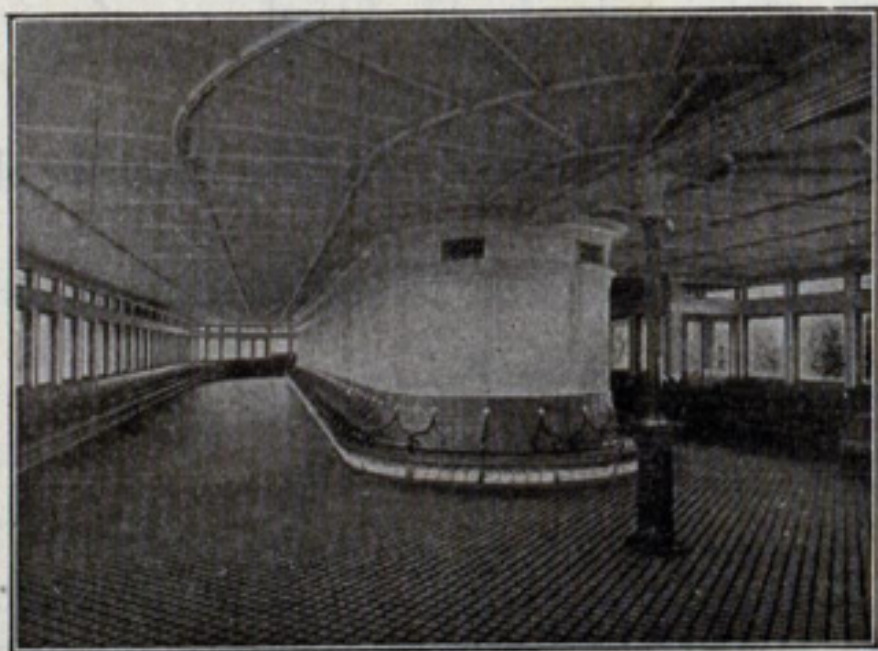
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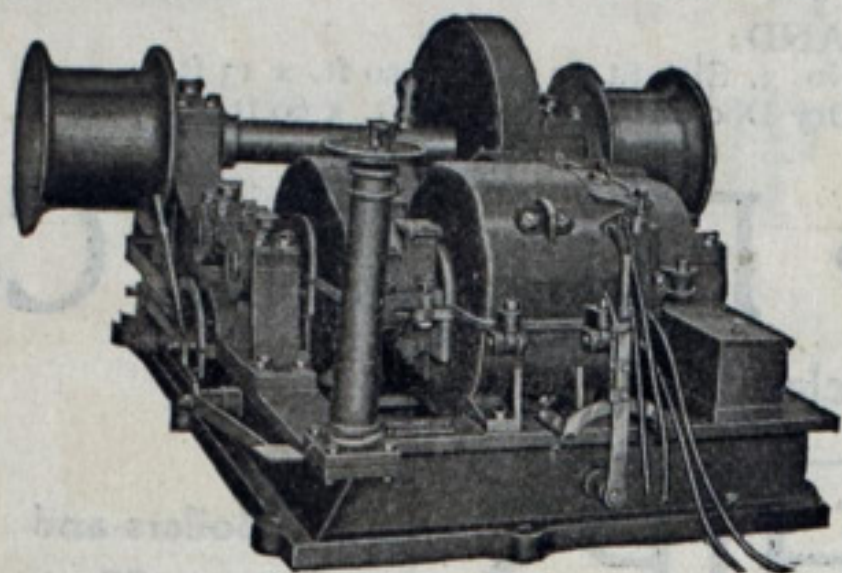
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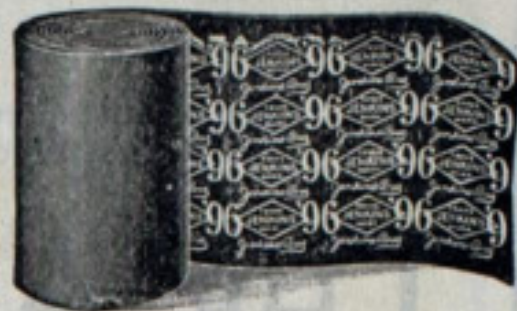
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